RULE THE WAVES II

GAME PLAY MANUAL AND NOTES

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VERSION 1.0

INTRODUCTION TO '*RULE THE WAVES II*'

Rule the Waves II is the sequel to our successful game of ship design and naval battles, Rule the Waves. Whereas Rule the Waves ended by 1925, Rule The Waves II covers the entire time period from 1900 to 1955, including aricraft and aircraft carriers. Ownership of Rule the Waves is not required to be able to play Rule the Waves II.

Rule the Waves II places you in the role of 'Grand Admiral' of a navy during the first half of the 20th Century. The game is centered on designing ships and fighting naval battles, but politics, economic and foreign policy decisions will be necessary as the Player guides their navy's deployment, construction and operations during a period of great technological innovation and political tensions. Rule the Waves is modeled on the period up to the end of the second world war, but is not intended to precisely recreate history. Rather RTW2 gives the Player the tools to lead a navy during the era when 'steam and iron' dominated the high seas.

Rule the Waves II is not a simple game. Some grasp of 20th century naval warfare and warships is recommended.

Game Play

This manual is organised in a section describing the mechanisms and 'rules' of the game, then a section describing the game interface.

Selecting a nation

When you start a new game, you will first select a nation for you to play. You can click the flags of the playable nations and see the main characteristics of the nation as well as their enemies. You can only play the AI, there is no human to human play.

You must also select a fleet size, which determines the size of your budget, and thus the size of your fleet. The size which most closely corresponds to real fleet sizes during the period is large or very large. Be aware however, that managing a big fleet with tens of battleships and several dozens of cruisers and destroyers will be a large administrative task. It is suggested that you play your first game with medium or even small fleet size.

The budgets given to the different nations are somewhat compressed in their variation and not totally historical, as that would leave some smaller nations unable to compete with for example Great Britain. The naval budgets in the game are different from each other, but not so much different as in the real world. If you want to play with more historical budgets, there is an option for that. Note however that when playing with historical budgets, some smaller nations may find themselves constantly short on money and at a decided disadvantage versus larger nations.

Playing minor naval nations like Austria-Hungary or Spain at small fleet setting is not really recommended, as that may result in very limited resources for the player.

In addition to the budgetary differences, there are other advantages and disadvantages to the different nations that reflect historical factors. The nations also have research advantages in different areas and some bonus technologies that they will research easily. Great Britain has some

advantages and disadvantages from its status as a global naval power. See national characteristics below for details.

Options

There is an option for setting research speed. Setting research speed lower than 100 will slow down research.

There is an option for varied technologies. Varied technologies were introduced as a way to recreate historical uncertainty about which way technology development is moving. We as players have full hindsight and we know what naval developments were ultimately the most successful. Ship designers and admirals in the early 20th century had no idea. Is a big gun battleship really a good idea or not? Are torpedoes really the threat they are made out to be? Nobody knew! That is the situation that varied technologies is intended to recreate.

The effects of playing with varied technologies are varied and will change from game to game. Technologies might arrive later or be harder to invent. Some technologies may be easier to invent. Some technologies may not live up to their promises. Long range gunnery could suck, multiple gun mounts turn out to be a bad idea, torpedoes are not as good as expected etc.

So remember that when playing with varied technologies you are really in a parallel universe where things did not turn out the way they did in our regular naval history.

There is a specific option to slow down air development. This is for those players who want to prolong the period when battleships dominated the seas.

Historical budgets was explained above and manual build of legacy fleet is explained in the next section.

Your fleet

There is an option to start the game in 1900 or 1920. When the game starts, there will be an existing legacy fleet. If you start in 1920, the legacy fleet will always be built automatically, as there would otherwise be too much scope for the player to tailor the existing fleet. Part of the challenge is working with the ships you inherited from your predecessor.

If you start in 1900 you will have the option to let the existing fleet of your nation be automatically built, or you may choose to design and build the ships of the legacy fleet yourself. It is recommended that you start with an existing legacy fleet the first time you play the game, as building the legacy fleet can involve a lot of ship design, and it might be better to learn the design process gradually.

If you elect to build the legacy fleet yourself, you will get an amount of money as your starting funds, to be used for buying the ships existing at the start of the game. This will be done in two steps. In step one you will design and build existing ships. Then, in step 2, you will order ships that are under construction when the game begins. You can only keep a proportion of your starting funds for buying ships under construction. The majority must be spent on ships already existing.

Ships under construction will be about 50% complete when the game starts, but you only pay 5% of their cost. This will in effect give you a 45% discount on these ships, which is potentially a big advantage. The downside is that completing these ships may tie up resources better used in research and building more modern ships.

The Budget

You will have a yearly naval budget at your disposition. The budget is a function of the base resources of the nation and the proportion of expenditures devoted to the navy. Both of these can vary as an effect of various events in the game.

The base resources will increase as a result of wars won, and decrease when wars are lost. Loss or gain of possessions will also affect the base resources available. The base resources will also increase steadily at about 3-5% a year as a result of economic growth.

The naval budget percentage will vary with various events and your response to them (see Events). In general it will tend to rise in times of high tension and be low in periods of low tension.

Your yearly budget will be divided into monthly payments to the navy. Running out of funds is not a good idea, and will tend to upset the finance ministry and lower your prestige. You can run up a surplus and save money for future expenses or for building that super battleship. Be aware however that if you have substantial funds in your coffers, the Kaiser, Prime Minister or the finance ministry might find a use for some of those funds.

Areas and possessions

The world is divided into areas. In each area there are a number of possessions that can be controlled by one of the player nations. In some cases they can also be neutral. The possessions have naval bases and can have coastal artillery or other defences. The base values and fortifications of possessions can be improved by the player.

Possessions can change hands, most often as a result of peace treaties. In some cases possessions can be transferred in other ways as a result of events. This represents for example the seizure of Ottoman territory by Italy in 1912 or the sale of the Danish West Indies to the USA. If a player nation acquires new possessions in an area where other nations are preeminent this will probably increase tension.

The possession value is used when calculating the budget effect of acquiring or losing possessions. The budget effect of possessions is relatively limited compared to the rest of income. Income from colonies will slowly decline over time.

Some possessions have oil, and access to oil fuel is necessary to build oil fuelled ships before 1920. After that, oil extraction and trade is assumed to have spread so that all nations can gain access to oil. Before 1920, oil might be randomly discovered in new places.

Strategic deployment of ships

Ships are deployed in an area, either a home area or on a foreign station. The number of ships that can be deployed in an area is dependent on the base value of the area. The number can be exceeded, but this may cause ships to suffer from maintenance problems and reduced crew quality. If a nation has no bases in an area, only a very limited number of ships can be deployed, representing single cruisers and the like that coal at bases of friendly or neutral nations.

Base limits are checked at the end of the turn. That means that you can move a fleet into an area where you have insufficient bases and fight a battle before the ships start to suffer from lack of bases.

Nations are required to have a minimum naval presence in each area where they have possessions. This is expressed as a

tonnage required in each area, and is dependent on the number and value of the possessions owned by the nation. Only active ships count for the purpose of calculating the naval presence in an area. If the required number is not met, player prestige may suffer and it might even lead to revolts in the affected areas.

Ships equipped for colonial service count as 1.5 times their tonnage on foreign stations.

Ships with cramped accommodation and ships with short range are less useful on foreign stations and will count as 70% of their actual displacement for the purpose of fulfilling this requirement.

Note that you may want to keep more ships than required on foreign stations to be sure of having an adequate force if war should come.

During wartime, the deployment requirements are not enforced if you are under blockade.

Fulfilling the requirements for ships at foreign stations can be done either manually by moving ships to the relevant areas, or by simply assigning them to Foreign Service, whereupon the AI will move the ship to a suitable area. The latter way is quicker if you for some reason need to fulfil sudden foreign service requirements quickly, for example after acquiring territory in a war.

Movement

Ships can move to adjacent areas in one strategic turn (one month). You can give orders for ships to move to an area farther away, but the ships will then plot their own course to the destination.

Only ships present in an area can take part in battles there. Ships that are moving count as present in the destination area for battle purposes. Short range ships cannot move strategically during wartime.

Blockade and movement

If a nation is blockaded, ships are not allowed to move out of the home port unless as raiders, and these may be intercepted by the blockading nation.

Maintenance and readiness

Ships in commission can be put in varying states of readiness, which will affect their maintenance costs, but also their readiness for war.

Ships can be in the active fleet, which have the best trained crews and are immediately available for service.

Ships in the reserve fleet are manned by reservists and take one month to mobilize and additional time to get to full effectiveness.

Ships that are mothballed also take one month to mobilize. Their crews will be poorly trained and take substantial time to get to full effectiveness.

New ships will be placed in "Working up" status until they have decent crew quality. They can be changed to another status by the player (but not back). Ships in working up status will not take part in battles.

Ships under repair will always cost 1½ times the active maintenance cost, regardless of their status. This is to reflect the cost of making the repairs. In some situations it might not be worth the cost to repair an old ship, and it might be an attractive option to scrap it instead.

In wartime, maintenance costs will rise sharply.

Training

You have the option of setting special training for your crews. Each special training subject selected will increase maintenance cost for your ships. It takes 12 months to achieve proficiency in an area. You have to keep on spending on training to keep the benefits. The benefits disappear immediately upon stopping spending on that type of training. The different kinds of training are:

Gunnery: Gunnery training will give your ships 10% better accuracy when firing guns. 30% increase in maintenance.

Night fighting: This will give your ships a bonus when spotting enemy ships at night, and less chance of hesitating before opening fire at night. It also gives a 10% accuracy bonus at night. 20% increase in maintenance.

Torpedo tactics: This will make your light forces more alert when carrying out torpedo attacks, quicker to react on flotilla attack orders and give better hit chances when firing torpedoes. 20% increase in maintenance.

You can select a maximum of two special training subjects.

Mine warfare

Mines are represented in three ways in RTW2.

There will be a defensive minefield around all bases. You will see those of the enemy but not your own. The purpose of these is to prevent enemy ships from operating unrealistically close to enemy bases.

There will also be small minefields present in scenarios near enemy bases and coastal artillery positions. They will be more common the longer a war progresses. These minefields will be invisible until one of your ships hits a mine. Screening light ships will protect your heavy ships from these to an extent.

There is also operational mining carried out in the monthly turns. Ships equipped for mine laying will be assumed to carry out mining in the area they are deployed. Minelaying submarines will also contribute to operational mining. This mining is abstracted and will not show on the map, but will increase the risk of enemy ships falling victims to mines. Friendly minesweepers (KE with minesweeping capability) will help mitigate the risk of striking mines.

Canals and other choke points

There are two canals in the game, the Suez canal and the Panama canal. The Suez canal is operational at the start of the game, and is controlled by the nation owning Egypt (Britain at the start of the game). The Panama canal will become operational in 1914, and is controlled by the player owning Panama (the USA at the start of the game).

Movement through canals is normally possible for other nations than the owning nation. During wartime, canals will be blocked for players at war with the owner or if the tension level with the owner is 7 or higher.

Invasions and amphibious operations

Each nation has an invasion range, expressed in nautical miles. This is the range from friendly ports that you can conduct an invasion. It is measured from the nearest friendly port to the nearest enemy port in the intended invasion target possession. If the range is greater than your invasion range, you cannot invade.

The invasion range is modified by advances in the tech area Amphibious operations. It is also increased for global naval powers and for nations with surprise attack ability during the first year of a war. It is lowered for blockaded nations.

Your current invasion range is shown in the lower left of the main screen. By pressing the invasion range button on the world map, you can see invasion range circles from your bases.

To start an invasion, you select an enemy possession within your invasion range, either by clicking on the possession flag on the map or via the possessions list to the left. Once you have selected a target you should move naval forces into the area. For an invasion to take place you must have more strength in the area than the enemy, but there is also a random roll made each turn, so it may take a couple of months before the invasion is actually launched. The larger your naval superiority, the greater the chance of an invasion taking place.

Advances in amphibious capability will affect the chances of being able to carry out an invasion once you have selected an invasion target.

When the invasion takes place, you will have to fight a battle where you escort an invasion force of transports to the beaches. If you win the battle with more than marginal victory, the invasion has succeeded.

The enemy nations will of course also have the capability to invade your possessions, in which case you will have to fight a defensive invasion battle.

Blitzkrieg

A nation that has a fascist, or to a lesser extent communist, regime can seize possessions in blitzkrieg invasions. Blitzkrieg invasions cannot take place before 1935. The chance of blitzkrieg invasions will be highest at the beginning of a war and then be reduced. As a player, you will be consulted on blitzkrieg attack plans by the General Staff.

Research

You define a portion of your budget up to a maximum of 12% as spent on research. On higher values there is a diminishing return.

There are a number of different research areas, from battleship projectiles to submarine technology and a lot in between. In the research menu, you can shift priorities between different research areas. Note that these priorities are relative, so setting all research areas to high will not increase research, it will just mean that all are equally prioritized. To prioritize everything is to prioritize nothing, to paraphrase Frederick the Great.

Spending on research will lead to research advances, which will have varying effects depending on the area. Advances in Hull construction and Machinery development will reduce the weights of those components in new ship designs. Other research areas will unlock various technologies to be used in ship designs.

If there are no technologies to discover in a research field, research points spent there will be reallocated to other areas and not wasted.

Designers Note*: Research in RTW2 differs from many other games where you can specify a tech before it is invented and tell your scientists to invent that. RTW2 has*

Designing ships

The first step in building a ship is designing the ship. In the design window you can design any ship you need in your navy, from destroyers to super dreadnoughts.

You can get to the design window either by clicking the design ship button or by selecting an existing ship, right clicking and selecting 'open design'.

In the design window you determine the characteristics of the ship you want to design. Note that a number of the available technologies and features might need to be researched before they can be used in a ship.

Ships designed will have their ship type determined automatically by the program. This is to prevent unrealistic ship designs

and also because the ship types are used by the tactical AI, and a 30000 ton destroyer with 15 in guns will tend to confuse the AI. Very unusual designs will be disallowed by the program as illegal ship types.

The easiest way to design a ship is to select an existing class and open the design. You can then alter or modify the existing design and save as a new class. This saves work because most ships tend to be developments from existing classes, and you don't have to enter all the values from scratch.

Alternatively, you could just select the ship type and let the computer auto design the ship for you. You can then alter any details you might want fixed.

After you have designed your ship you will get a report on the design and any problems it might have.

Items labelled 'Error' in the report must be fixed, otherwise the design is not legal.

Items labelled 'Note' in the report are just reminders or hints that can be disregarded.

Ship designs should have their weights kept within the displacement limit. You are allowed to build ships that are slightly overweight, but that will carry a penalty in stability and flotation, and is usually not cost effective compared to increasing the size of the ship. Its main use is if you have a displacement limitation, for example by a treaty or in dock size.

Normally, the first ship in a class will cost 10% extra to simulate the costs of developing the design. A ship developed from an earlier design will get a discount on the development cost. To develop from an existing design, right click on an existing ship in service or in construction and select "open design". When changing the design,

you can see the percentage of the development cost you will pay in the top left corner in the "Developed from" box. The more changes you make the smaller the discount, and if you make big enough changes you will have to pay the full development cost.

Generally the following are the limits for change before it becomes an entirely new design with no discount.

* Displacement can increase by a maximum of 10% or 1000 tons.
* Main guns over 6 in cannot be changed.
* Secondary guns over 6 in can be changed to a limited extent.

* Speed can be changed by one knot.
* Vertical armor can be changed by one in and horizontal armor by half an in.

See appendix 2 for a fuller explanation of the various values used in designing a ship.

Building ships

Once you have the design ready, you have to complete a design study for the new ship. This takes from 1 to 4 months depending on ship type. After that you can build ships to the new design.

> **Tip**: It can be a good idea to leave a few tons unused on your ships so that there is space for a minor rebuild of for example the fire control system without making the ship overweight.

The time to complete a ship is dependent on the ship type and can be modified by having an efficient or undeveloped shipbuilding industry.

The cost of building a ship is paid in monthly instalments during the build time. If you run into budget problems, it is possible to temporarily halt the construction of one or more ships.

You can also accelerate the construction of a limited number of ships. This will build them 10% faster, but with a 5% increase in cost. Having ships in accelerated construction risks causing delays in the construction of other ships.

In the build dialog, you can select to have up to 12 ships of the same class laid down. The names will be assigned automatically. This might be very handy when building large numbers of destroyers for example. Note however that you will have to consider if your monthly budget is enough to build that many ships.

AMCs may not be built in peacetime. After a war, they will be automatically sold off to civilian shipping companies. The same applies to corvettes of less than 600 tons.

Rebuilding ships

You can rebuild existing ships, but there are limitations on what can be rebuilt. The following actions can be taken while rebuilding ships:

You can change the main armament according to certain conditions. Guns can be changed to more modern versions of the same calibre. Triple turrets can be changed to double turrets with larger guns or vice versa if the calibres are compatible. Double turrets can be changed to single turrets or vice versa if the calibres are compatible. For example, a double 8 in turret can be exchanged for a single 10 in turret or a triple 12 in turret can be exchanged for a double 16 in turret. To see the combinations available during a rebuild, select the turret and press the 'Rebuild?' button under the turret list.

You can change the secondary battery if the existing guns are in casemates or in turrets of 6 inches calibre or less. It can be changed to any arrangement of 6 in guns or less. The same with tertiary guns.

You can swap out the machinery for more modern machinery, increasing speed or using the weight gained for other purposes.

Fire control can be improved

You can add bulges, which will increase torpedo protection but will also reduce speed.

You can also rebuild ships to aircraft carriers (CV or CVL) provided you have researched the technology.

Some rebuilds will change the ship type, most often from something else to CV, but sometimes BC will be reclassified as BB.

Docks

In the game, dock size is used as a limit to the largest ship your nation can build and operate. You cannot build ships larger than your current dock size. Occasionally it is necessary to increase your maximum dock size. Docks take one year to build. Each building step will increase your dock size by 2000 tons. Try to plan ahead. Waiting an extra year to lay down your new battleship can be very frustrating. Dock size may occasionally increase by itself as a result of development in private shipbuilding.

If you cannot build ships at home, you can contract them to foreign yards. You will then be limited by the building nation's dock size. This can have a further advantage if your own nation has an undeveloped shipbuilding industry, as the construction time will be determined by the characteristics of the building nation.

The drawback to building ships abroad is that you risk that your ships will be impounded and not delivered if a war breaks out. The risk of this happening depends on the tension level with the building nation. If you have a treaty with the building nation, they will always be delivered.

Submarines

Submarines are built much like normal ships, but you cannot design them, they are selected from standardised types. The different types of submarine will be available as a result of your submarine research.

The different submarine types are: Coastal submarines, Medium range submarines and mine laying submarines.

Coastal submarines have shorter operational radius, so will only occur closer to your bases. They also have limited torpedo capacity.

Medium range submarines are the general run of the mill submarine.

Minelaying submarines are much like medium range submarines, but can also lay mines. On the other hand, they have a reduced torpedo load.

Advances in submarine technology will increase the serviceability and the attack effectiveness of your submarines.

Submarines will participate randomly in battles, in proportion to the number of submarines available to either side.

Submarines will also force the enemy to assign ships to anti-submarine patrols.

During wars you have three policy options for your submarines:

Fleet support means that submarines will primarily operate against enemy warships

and only attack enemy merchant shipping in very clear cut cases.

Prize rules means that your submarines will attack shipping, attempting to follow prize rules. The occasional incident that will upset neutral nations cannot be avoided.

Unrestricted means your submarines will carry out unrestricted submarine warfare against enemy merchant shipping at the expense of operations in support of the fleet. This will increase sinkings of enemy merchant shipping and may cause starvation and higher unrest level for the enemy. However, it will also anger neutral nations and risk bringing in additional enemies against you.

Submarines will have a sharply reduced effect on enemy merchant shipping if you are blockading the enemy (enemy merchant shipping is assumed to have been reduced to a minimum by the blockade).

Coastal artillery

You can build coastal artillery batteries in the same way you build ships, except that you do not design them and can only chose between predefined types. Coastal artillery must be built in a specific possession.

Coastal artillery will be assigned randomly in proportion to their numbers to positions on the coast of the possession where they are located, and will be available in battles at that location.

Coastal artillery positions will also increase the number of local minefields in the vicinity of the battery.

Intelligence

You can set a level of intelligence collection for each other nation. Intelligence activities might give information on research in other nations, boosting your own research, or it might yield information about the capabilities of enemy ships.

Intelligence activities carry a risk of detection. If your agents are discovered, it will increase the tension level with the nation in question.

Enemy ships

The information you can see about ships belonging to other nations is restricted. For ships under construction, you will only be able to see the ship type and displacement. For completed ships you can see the ship type, displacement, number and calibre of guns and speed, although the official numbers may be misleading.

By performing intelligence you might glean additional details, like armament, armour thickness, torpedo protection etc.

Tension levels

The player nation has a tension level with every other nation. When the tension level rises, there will eventually be a risk of war.

Normally, the tension levels will rise slowly over time and there will usually be several years before a war breaks out. However, you should be aware that there are some events that can cause a war to break out rather quickly and unexpectedly. Thus, you cannot let your guard down and think that any war is in the future. You should keep your navy in shape to fight a war at any time. If you scrap too many old ships and count on having new ones ready in a year or so, you might find yourself in an awkward situation if the international situation takes a turn for the worse. Also, the press and the navy league might come down hard on you if they think the navy is too weak.

Events

There will be random events and crises from

time to time, and you will have to respond to them, mostly by giving advice to the government. "Hawkish" answers will tend to raise the budget and your prestige, but they will also tend to raise tension levels. "Dovish" answers will tend to lower the tension levels, but risks lowering your prestige and/or the naval budget.

In the event dialog, hover the mouse over the event answers and you will get a hint on the effects of the different answers.

> ***Designers note:*** *Most events are geared towards European politics in the 20th century. While the events that can occur and their likelihood are different depending on government type etc, there are still some events that may feel more appropriate to Europe than the USA or Japan.*

Prestige

Prestige in the game represents your general reputation, based mostly on your standing with the Monarch/President and the politicians, the officer corps and other parts of the establishment. Your prestige will be enhanced by generally 'tough' responses to events and success in battle. You prestige will be lowered by 'soft' responses, defeats and mismanagement.

If your prestige goes too low, you will get sacked, thus losing the game.

Unrest level

The unrest level represents the feeling among the workers and lower classes. A high unrest level will lead to strikes and demands for lowered military budget, and in wartime can lead to revolution and defeat. Revolution is less likely in liberal democracies.

The unrest level is raised by:

- High military spending
- Long wars
- Being under blockade
- Cramped accommodation in ships
- Defeats

The unrest level is lowered by:

- War breaking out (initially, but longer wars will have the opposite effect)
- Social programmes (event answers)
- Victories
- Low military spending

The amount of money spent for naval and military purposes is the most important factor in affecting the unrest level in the nation. Possible unrest in effect acts as a brake on the naval budget in the game. If you relentlessly press for higher naval expenditures, you will find that the unrest level will be going up. Entering a war with a high unrest level might leave you vulnerable when blockade or trade disruptions caused by war increase unrest further.

Arms limitation treaties

Treaties will result from disarmament conferences, and these are an effect of event responses. You can affect the chances of a treaty by your answers, but 'tough' answers disdaining treaties will tend to raise tensions.

A treaty will set a limit in displacement and main armament calibre for new ships laid down, and will run for a number of years, usually 4 to 12. All ships under construction at the time of signing the treaty that do not fulfil the terms of the treaty will be scrapped. Existing ships may be kept, and may be rebuilt and modernized, even if they exceed the treaty limits.

Liberal democracies must adhere strictly to

the treaty. Other nations may 'cheat' by up to 10% of the displacement. No cheating is possible on the main calibre.

Allies

There are several advantages to having an alliance with another nation. An alliance will keep down tension with that nation, and the ally will support you in a war (this will mostly be represented by a VP addition each turn). An ally is also more prone to sell you technology, and will do so at lower prices. You can also buy aircraft types from allied nations.

Allied ships may show up on your side in battles. Similarly, if you are at war with two nations, the allies of your enemy may show up. Allied bases and coastal batteries will also be present in battles.

There are also some potential disadvantages. You might be embroiled in conflicts that are caused by the foreign policy of your ally, and the existence of the alliance might raise tensions with other nations.

Allainces can be revoked if tension goes up between the allies. Alliances have a larger chance of being revoked if one nation is fascist/communist and the other is liberal democracy.

Alliances will not be revoked during war. Instead, your ally may seek a separate peace if tension with them goes high enough.

Peace

During a war there will be events relating to possible peace negotiations. Your answers to these will decide the chance for a peace and also the nature of that peace. In a victory, you may gain increased base resources, possessions or even ships from the enemy's fleet, depending on the magnitude of your victory. Conversely, if you lose a war, you may yourself lose some of the above.

When you win possessions, you will be presented with a list of enemy possessions to choose from, and the number of value points you can select. Unused points will gain a small increase in your base resources instead. You can even decline to take any possessions and be satisfied with the base resource gain.

Surprise attacks

A surprise attack may occur on the first turn of war, if one of the nations has the national characteristic "Surprise attack". A surprise attack will take place at night and involve a group of destroyers making a torpedo attack on the enemy fleet at anchor, with a heavier group of ships following up. The defending ships will be initially surprised.

To make the most of a possible surprise attack, you should have a decent force of destroyers in the same area as an enemy base. Having well developed torpedoes and destroyers also helps of course.

Surprise attacks in the game are arranged so that they can succeed brilliantly, but be prepared that surprise attacks can occasionally end in relative failure.

> **Note:** *Ships in reserve or mothballed status might be included as defending ships in a surprise attack, even though they will otherwise not take part in battles. This is to make them vulnerable, and make it impossible for the player to 'hide' ships from surprise attacks by putting them in reserve.*

Surprise attacks between 1925 and 1935

will be replaced by a submarine sneak attack. Surprise attacks after 1935 will be a carrier aircraft attack on the enemy's fleet in port.

National characteristics

Efficient shipbuilding industry: Ships will take 10% shorter time to complete.

Undeveloped shipbuilding industry: Ships will take 10% longer to complete and are more prone to have unexpected faults, like not reaching their design speed.

Global naval power: Nation must keep at least 10% of tonnage on foreign stations, cannot have cramped crew quarters. May get automatic budget raise if any other nation has a similar budget.

Cautious: AI controlled forces will be cautious in battles. Player risks extra prestige loss on losing battles or losing capital ships.

Poor education level: Affects the crew quality and build times of ships, and has a slight negative effect on research.

Liberal Democracy: Lowers the risk of revolution and will affect some events.

Autocracy, Bombastic head of state: Will affect the likelihood of certain events.

Surprise attack: The nation has a penchant for starting wars with a surprise attack on the enemy fleet. There will be an 80% chance of a surprise attack on the enemy fleet at the start of a war.

Inconsistent naval policy: The politicians are more likely to interfere in ship building design and priorities.

Attention to detail: Ships are less likely to have hidden defects or vulnerabilities.

Technology Leader: The nation has an advantage in research, and if AI controlled will spend on research to stay among the top nations in technical development.

Hidden faults: Ships may have unexpected faults, like a tendency to explode on turret hits or similar.

Kamikaze: The nation will practice suicide air mission if losing a war (see air sections).

Blockade

To blockade a nation, you must have 110% of the enemy's naval strength in the build area of the enemy nation. Naval strength for this purpose is computed as a sum of all ships in the area, weighted by type. Some nations have their blockade strengths modified. For example, Britain has its blockade strength multiplied by 1.2 to account for its geographic position and its dominance in trade and finance. Russia has its blockade strength multiplied by 0.7 to reflect its geographic position.

If you are a blockading nation in a war, you will earn a number of extra VP per month as long as the blockade is kept up. A blockaded nation will also suffer a higher risk of the unrest level going up, which can ultimately lead to revolution and defeat.

A blockaded nation will not be able to move ships out of its build area, except as raiders, which are subject to possible interception as they break through the blockade.

Fleet Exercise

You can hold a fleet exercise once a year with any ships you select from your own fleet. Ships participating in the exercise will cost twice the active mantenance cost and gain some experience. Large fleet exercises can raise tensions. In effect you will play out a battle against a part of your own fleet, with no permanent damage of course.

A fleet exercise is a good way of learning the battle system for first time players, or a way of testing tactics and designs.

Battles

When a war breaks out, there will be a chance of some kind of naval action every turn. The missions might be:

Fleet battle: A decisive battle with the entire fleet of both involved nations.

Cruiser battle: A battle between cruiser forces.

Coastal raid: Various kinds of bombardments, attacks on merchant shipping or other offensive activities near the enemy coast. The forces involved can vary but are usually based on faster ships up to battle cruisers in strength. In these battles coastal artillery and patrol craft will help the defending player.

Convoy attack/defence: Attack or defence of a convoy, usually with cruiser forces.

You will be presented with a screen with a force estimate of enemy strength, where you have the option to accept or decline battle. Declining a battle will cost victory points, and may cost prestige after several declined battles. There is a chance that the enemy will decline battle if they are feeling that they cannot send out a force with reasonable chances of victory.

If you accept a battle, you will be brought to the tactical resolution screen, which is similar to a SAI scenario. The ships at your disposal will be randomly selected from the ships in the area according to the size and type of battle.

Sometimes there will be an additional friendly AI controlled support force present. This can both be a blessing and a source of problems. Sometimes the support force will save your skin, sometimes it can charge ahead and be involved in battles you would want to avoid.

The majority of battles will start with manoeuvre controls locked and the fleets meeting shortly. In very rare cases, mostly if visibility drops sharply, the fleets may miss each other and the battle will be without contact between the fleets.

In coastal raids, there will be a large element of manoeuvre and finding (or avoiding) the enemy fleet.

After a battle, when you have finished studying the result, just close the battle screen to return to the main RTW screen.

Trade protection

When war breaks out each nation will be required to keep a number of ships on Trade protection. The number of ships required will be proportional to the fleet size and modified by the strength of the enemy submarine force. Ships on Trade protection are counted in one global pool, and their exact location is not important for fulfilling the requirement.

Ships assigned to trade protection will not normally be available for fleet operations. However, in non home areas, any ship present might be used in battle.

DD and KE assigned to trade protection will be on ASW patrols or assigned as convoy escorts.

Cruisers assigned to trade protection will patrol against enemy raiders and provide heavy convoy escort.

The most cost effective ships for Trade protection are destroyers, corvettes and small armed merchant cruisers, but cruisers can be needed if raiders are about. Older destroyers no longer fit for fleet duty are an ideal candidate.

If you do not satisfy the Trade protection requirement, there will be a larger chance of enemy submarines sinking merchant ships and your prestige may suffer. Stronger patrols than required will hamper the operations of enemy submarines and increase the chance of sinking them. Also,

the crew quality of patrolling ships will have an effect, so putting your worst crews on ASW patrol might not be profitable.

Ships on Trade protection may be present in defensive costal battles in the area where they are deployed, but will otherwise have a low chance of being involved in battles.

AMC:s can be used on trade protection patrols and if you have invented Q-ships, they can surprise and sink enemy submarines.

Raiders

During war, you can send out ships as raiders to prey on enemy shipping. Raiders cannot be short range ships and are more effective if they have long range and relatively high speed. Generally, cruisers are ideal for this mission.

Raiders run a risk of being intercepted by enemy trade route patrols and brought to battle. Note that a raider winning a battle but suffering significant damage might be forced to scuttle itself or seek internment in a neutral port.

There is a slight risk that raiders run out of fuel, especially if not long range or of large size, or suffer a mechanical breakdown. This can force them to be interned in neutral countries until the war is over.

AMC:s can be effective as raiders, despite relatively low speed, due to their ability to disguise themselves as normal merchantmen. A speed of at least 8 knots is required. Large fast AMC:s (fuel hungry liners) are however prone to running out of fuel. An AMC raider has a chance of deceiving and surprising an enemy intercepting ship, with the interception battle starting at short range and the intercepting ship surprised.

If you are blockaded, ships deployed as raiders may be engaged by enemy ships while breaking out to the trade routes.

Raiders have no effect if you are blockading the enemy (enemy merchant shipping is assumed to have been reduced to a minimum by the blockade).

Scout aircraft on ships

Ships equipped with scout aircraft will be more effective as raiders. They will also be more effective at hunting raiders.

Anti submarine and mine warfare

Each ship has a rating for its capabilities in these fields. However, if the ship has a capability in more than one of these fields, the effectiveness of each will be reduced, to reflect the fact that the ship has to divide its time between the various duties.

ASW warfare

Ship types capaple of ASW warfare are DD, MS, CV and CVL. Ships capable of ASW warfare have an ASW rating. The ASW rating of a ship depends on displacement and installed equipment. All DD and small ships will automatically have a basic amount of depth charges when these are invented. Additional ASW equipment, like increased storage of depth charges, K guns and ASW mortars, need to be added to the design and will cost weight.

The ASW value of CV and CL will initially be low, but will increase with development of aerial depth charges and airborne radar.

AMC will have a limited ASW value during the early period (as Q-ships).

Mine warfare

Ships equipped with minesweeping gear will contribute to a minesweeping value for each area. This value will be compared to enemy minelaying capabilities inthe area to determine the risk of ships striking mines during operational movement and also influence the number of minefields during battles.

Motor torpedo boats (MTB)

MTBs can be built once the technology is developed. MTBs will appear in coastal areas at night. They are always AI controlled, but will move around and attack enemy ships that they find.

Carrier construction

The type and size of the carriers you can build depends on the level of your "Shipboard aircraft operation" tech. You will only be able to convert existing ships into CVLs after you reach level 3 "Flight Deck". After that you will be able to build purpose build CVLs and then convert CVs and finally purpose build CVs. The displacement of a purpose built carrier will be limited by the level of the "Shipboard aircraft operation" tech X 4,000. CVLs are limited to no more than a capacity of 34 planes currently. There is no limit on CV capacity.

Carriers with aircraft capacity larger than 100 aircraft will have reduced aircraft operations efficiency as well as slightly increased cost. This is to reflect historical operational issues with discovered by the US navy with very large carriers.

Seaplane carriers

Seaplane carriers can be built once you reach level 1 of "Shipboard aircraft operation". Seaplane carriers can only carry floatplanes. Ships without catapults or a flight deck will need to stop to launch aircraft. Ships recovering seaplanes always need to slow down.

Radar

Radar will become available as a result of

research in the Radar and electronics field.

Radar is divided into search radar and fire control radar. Search radar makes it possible to detect other ships in poor visibility. Radar detected ships will show as greenish outlines on the map. Early search radars are unrelaible and prone to malfunctions. They are easily disabled by hits or even by own ships guns firing.

Fire control radar helps gunnery, and from level 3 will allow blind fire.

Once radar is invented, a nation will receive a number of radar sets per month. Radar sets will be automatically installed in ships with priority given to larger ships and ships in the active fleet. The player can manually install radar sets in ships, with the drawback that the ship will be unavailable the current turn.

Fuel Shortage

Nations without access to oil run a risk of suffering fuel shortages in wartime. The risk of fuel shortage occuring in a turn will increase the longer the duration of the war. If a nation is blockaded, the risk of fuel shortage will increase considerably.

In a turn with fuel shortage, there is a risk that ships will have ordered strategic moves cancelled or that they will be unable to take part in a battle. The larger the ship, the greater the risk of being affected.

Ships using coal fuel will never be affected by fuel shortages.

Diving shells

Once invented, diving shells can be selected for use in the ammo doctrine screen. Diving shells have a chance for long range near misses to be converted to hull hits bypassing armour. On the flip side, diving shells have a larger chance of passtrough hits and duds.

Oxygen fuelled torpedoes

When oxygen fuelled torpedoes have been invented, their use can be selected in the doctrine screen. Oxygen fuelled torpedoes give considerably better torpedo performance at the risk of more devastating torpedo explosions if torpedo tubes are hit.

Winning or losing a war

Battles and other events will gain victory points. When one side has a substantial advantage, there will be chance for some kind of peace agreement. Peace agreements might entail the loss or gain of territory, simulated in the game by gaining or losing possessions, which will in turn affect your base national economy. They might also involve handing over ships to the victor or restrictions on the shipbuilding of the losing nation.

Wars might be lost by revolution if the unrest level goes too high. Wars lost in this way will lead to unusually harsh conditions. Thus, if you notice that your unrest level is going up, you are well advised to consider reining in military expenditure and consider some kind of social reforms. If that doesn't help, a negotiated peace is a lot better than revolution.

Construction Choices

This is a summary of the construction choices available when designing ships and their effects in the game.

Low Freeboard

Ships with low freeboard will save weight but are more affected by the sea state, with ROF reduced or sometimes turrets being out of action due to being swamped. Low freeboard can be selected for all ships, but

the benefit is larger for ships with top speed below 21 knots. Ships with low freeboard will have their speed and gunnery affected more in heavy weather than ships with normal freeboard. The ship is simply less weatherly.

Cramped accommodation

Ships with cramped accommodation save weight, but it may have adverse effects effect on the crew. Cramped accommodation might increase the risk of mutinies during wars, especially if the nation is under blockade. Ships are less useful in the colonies if they have cramped accommodation and crew performance may suffer if away from home waters.

Armour schemes

Protected Cruisers

Protected cruisers will be more vulnerable to hull and superstructure hits, as well as splinter damage from near misses. Before you research light cruiser configuration, all CL:s built must be protected cruisers.

Belt and sloping deck

This is the standard WW1 era armour configuration. These ships will have extra protection against shells penetrating the belt damaging their vitals.

Flat deck on top of belt

These ships will have a larger volume protected by the belt and deck, but lack the extra protection offered by the sloping deck behind the belt. Note: An "all or nothing" ship (once you have researched it) should have this kind or armour layout and no BE or DE armour.

Narrow belt

This saves weight but means that shells that would have hit the belt instead might hit BE or no armour at all.

Casemates

Secondary guns in casemates are somewhat more vulnerable than secondaries in turrets, but casemate armour will absorb some hits that would otherwise hit un-armoured hull or superstructure. Casemate guns are more sensitive to weather interference and will get higher ROF penalty in heavy seas.

Turret top armour

The program assumes that turret top armor is slightly sloped, at least for part of the turret, so shell penetration is somewhat better against turret tops that against decks. For heavy guns it is recommended to have slightly thicker armour for TT than D, just as was common in historical ships.

Turreted guns of smaller calibres

Until accurate training and elevation motors are developed, there is a ROF and accuracy penalty for secondary guns of 6 inches and below in double and triple turrets.

This also affects main guns of 9 inches calibre and less in double and triple turrets.

Note that smaller guns will still have a higher ROF than larger guns, this is only a relative effect. Do not let this stop you from designing for example armoured cruisers with double 7 or 8 inch turrets as main armament. It is just that single gun turrets have some relative ROF advantages in the early parts of the game.

Triple and quadruple turrets.

Early triple and quadruple turrets will have slightly lower ROF and a higher chance of turret jams. Improved triple and quadruple turrets will rectify these defects.

Armor in general

Armour thickness up to 20 in allowed for belt armour, but increase in armour over 12 inches will not give the same proportional protection due to difficulties in manufacturing thicker armor plates. Turret armour can be up to 26 inches.

Coal or Oil fuel

Oil fuelled ships have slightly more expensive engines but get a smaller weight penalty for long range and more weight effective and manpower efficient engines. However, only those nations with access to oilfields can use oil firing before 1920. Coal fuelled ships get some extra hull protection from the coal bunkers.

Oil fuelled ships produce less smoke, so are less sensitive to own smoke interfering with spotting.

Engine priority

Engines optimised for speed are 8% lighter, but increase the risk of breakdowns. Ships optimised for reliability decrease the risk of breakdowns, but weigh 8% more.

Armour and splinter damage

Splinter damage can occur to hull, machinery, funnel uptakes, main guns and secondary/tertiary guns from near misses or superstructure hits. Armour of 2 inches and above will protect from splinter damage. If armour is less than 2 inches, there will be a risk of splinter damage proportional to the armour thickness. Note that tertiary guns are always considered to be un-armoured.

Gun shields

Main guns of 6 inches calibre and below in single turrets with 2 inches or less of armour will be considered as shielded mounts. These are lighter than normal turrets, but

are vulnerable to splinters (though not nearly as vulnerable as un-armoured mounts).

Colonial Service

Ships fitted for colonial service are more useful on foreign stations. This costs 60 tons displacement, which simulates increased marine contingent, storage spaces and other facilities useful for extended service on foreign stations.

Automatic loading

Autoloaded guns will have a 10% higher ROF. When the ship is straddling the target and going to rapid fire they will give a 30% boost to ROF. They also have better AA performance. They are about 25% heavier than usual guns.

Dual purpose guns

Dual purpose guns are about 25% heavier than usual guns, but are capable of both AA fire and engaging surface targets. 4 and 5 inch guns are the most capable DP guns.

AA directors

AA directors will considerably increase the effectiveness of heavy and medium AA fire. More AA directors will improve AA fire, up to a maximum of 4.

An AA director will provide a limited anti surface capability if there is no regular director installed.

Diesel engines

Diesel engines are heavier than steam plants but reduce the weight penalty of long and extreme range. Diesel powered ships have better acceleration.

Inclined belt

Inclined belt costs 10% more than a conventional belt. It adds about 10% to the

protective effect of the belt, but it also entails a risk that long range hits will be converted to deck or lower belt edge hits.

Box protection to magazines

If this option is selected, belt and deck thickness will be halved for hits to areas other than magazines. Belt and deck weight is reduced by 1/3.

All forward main armament

To get the benefit of all forward main armament (Nelson or Richelieu configuration) a nation needs to research all forward armament.

Interface

Loading and saving a game

Games can be saved at anytime from the main screen by pressing save game. The game will automatically be saved in the slot you selected for your game.

To load a game, go to the load game when starting RTW and select the slot you want to load.

You can also press continue in the start screen, which will load your last saved game.

Autosave

RTW will autosave after every month and at intervals according to preferences during battles. Thus, if something happens that causes you to exit without saving, game crash, power failure, whatever, you can always reload the latest autosave by selecting the game slot and pressing "Load autosave".

Sending a saved game

If you would want to send a saved game for some reason, just zip up the entire folder of your game in the RTW\Save directory, for example RTW\Save\Save1 if you are using game slot 1. All the ship design files are needed to reload a saved game, that is why it is not enough just with the save file. A save if often useful if you encounter a specific serious bug and want to make a bug report.

The Ship list

Most commands affecting your ships can be made by right clicking a ship in the ship list. Here you can put ships in the reserve fleet or mothball them. You can also open the ship design or define its mission as a raider, and you can order ships to move to other areas.

Many commands work for a number of ships if you multi select ships in the ship list. For example, you can put multiple ships in reserve, or give movement orders to multiple ships at the same time. When multi selecting, use the normal windows actions like holding down shift or control to select in the list.

In the construction tab you can see your ships under construction. Right clicking ships here will give you choices for halting or speeding up construction.

Explanations for the ship list:

Speed: After the speed in knots there will sometimes be letters denoting:
L = Long range
S = Short range
c = Equipped for colonial service
a = Cramped accommodation

Status: The abbreviations means:
AF = Active fleet
RF = Reserve Fleet
MB = Mothballed
R = Raider

FS = On foreign station

TP = Trade protection

A number means the ship is in repair for that number of months

* after the status means the ship needs maintenance and should return to an area with sufficient base capacity.

The strategic map

Left click in any area or on a possession when the map is zoomed in a bit to get details.

Right drag to move the map.

Mouse wheel to zoom in.

Right click in the tree to the left for more map options.

Hovering the mouse over an area will give you a tool tip window with information about ships of all nations deployed in that area. Note that ships will move before combat, thus forces may have changed when a battle occurs. This is to preserve some fog of war.

An area where ground combat is in progress will be marked with a red border on the strategic map.

The map tree

The numbers after each area is:

Total player nation tonnage in area, adjusted for colonial service capability

Base points of player ships in area / Total player nation base capacity in area

Giving movement orders to your ships

From an area details dialog. Click on the 'Move ships' button to go to the move ships screen.

or

From the main window, right click a ship in the ship list and select 'Move ship' to go to the move ship screen with that ship selected

or

On the strategic map hold down the mouse button and drag from one map area to another and release.

Note that you give movement orders to your ships that are actually executed when you press 'Turn'.

Also, if giving orders to move to an area two or more areas away, the ships will pick their own route there and the destination shown for them will be the next area on their route.

Ship pictures

You can optionally designate a picture for your ship designs. Pictures to be used should be placed in the save directory for the game (Save1, Save2 etc) under the 'RTW\Save' directory. Pictures for ships should be 640 x 160 pixels and in jpg or bmp format.

You can change the picture for an existing ship class by using the change picture function on the popup in the main ship list.

There is also an option to automatically generate a ship picture and add detail. To do this, use the generate picture function on the popup in the main ship list. First generate the hull. Select options and click "Generate". Change options and redo if you don't like the result. Then go to the superstructure and details tab. There you can select various types of equipment and superstructure. Click in the picture to select, move over the ship and click again to apply them to the ship.

See the appendix at the end of the rules for

more details.

RTW2 Air System

RTW2 introduces aircraft to the game along with many of the naval systems and vessels that supported this new weapon. In RTW2 you will be able to build and manage airbases and airship bases, design aircraft carriers, installing flight decks, catapults, armored hangars, flight deck armor and many types of AA weapons. You will be able to operate floatplanes from combat ships, issue virtual specifications for new aircraft designs, select designs for production, create and manage aircraft squadrons, and execute aerial searches and strikes during battles.

Airplane Types

Introduction

RTW2 simulates naval airplanes of 6 different roles. These are fighters, dive bombers, torpedo bombers, medium bombers , floatplane scouts and flying boats. Airships are also supported. Each type has its own set of restrictions that determine the types of strike missions available to the plane, the kinds of ordnance that can be carried and the type of base the plane can operate from. Below is a short description of each type.

Fighters

Fighters may fly combat air patrols (CAP) in which they will attempt to intercept and engage any attacking enemy squadrons. Fighters can execute bombing strikes if the specific model used by the squadron is capable of carrying bombs. Fighters will typically use a glide bombing attack when dropping bombs.

Fighters can fly escort missions to accompany and protect friendly bombers from attacks by the enemy CAP. To do this effectively the mission must be coordinated. Fighters on an escort mission that find no enemy fighter opposition can strafe the enemy ships. Fighters on aircraft carriers that are equipped with flight deck catapults may take off without the carrier needing to turn into the wind.

Dive bombers

Dive bombers may be assigned ground strike, naval strike and recon missions. Dive bombers will drop Semi-armor piecing (SAP) bombs with only moderate armor penetration ability until armor piercing (AP) bomb are developed through research. When attacking land targets they will carry general purpose (GP) bombs (roughly equivalent to HE rounds).

Dive bombers are very accurate at delivering their single bomb. The effectiveness of dive bombing can be improved by developing better techniques and equipment through research. When attacking, dive bombers are less vulnerable to enemy AA fire than torpedo bombers but more vulnerable than medium bombers.

A nation will not have access to dive bombers until they have developed the necessary technology through research. Occasionally an aircraft manufacturer will offer a dive bomber model to the player prior to the development of this technology. You will be able to use this aircraft model but you will not be able to develop additional dive bombers without the technology required.

Torpedo bombers

Torpedo bombers are the only carrier capable aircraft that can carry a torpedo, which is the most deadly ordnance that can be used by

aircraft to attack a ship. TBs can also carry normal bombs and will drop them using a level bombing attack, a far less accurate technique than either dive bombing or torpedo bombing. TBs will use level bombing when attacking land targets.

Torpedo attacks are very accurate and become more accurate and more powerful as new technology is developed. However, torpedo bombers are very vulnerable to both AA fire and enemy fighters.

Torpedo bombers are developed much earlier than dive bombers or medium bombers and for a number of years will be the only type of aircraft that can effectively attack ships. They remain the most effective anti-ship aircraft throughout the game.

Medium bombers

Medium bombers can only operate from airbases, but they typically have very good range to attack ships far out to sea. MBs normally use level bombing when attacking ships or land targets. This technique, while quite effective against land targets, is the least effective bombing technique to use against ships. However, medium bombers proved to be quite flexible historically. MB bombing techniques can be researched that allow them to utilize the much more accurate (and dangerous to the MBs) method of skip bombing, though it is only useful against unarmored ships. Some MBs can be equipped with torpedoes after the technique is researched. Late game technologies will allow some MBs to be armed with particularly deadly and accurate guided bombs.

The medium bomber, as used for naval purposes took some time to mature and in RTW2 you will have to develop the necessary technology through research. Medium bombers make excellent recon planes in the absence of flying boats. The monthly maintenance fee for medium bombers is about 20% more than for single engine planes.

Late in the game it is possible to develop guided weapons. When this occurs medium bombers will be equipped with these weapons however only 30% of medium bomber squadrons will have guided weapons once they have been developed. This is to reflect the fact that these weapons were not very plentiful.

Flying boats

Flying boats are the premier recon planes and often have ranges that are 3 to 5 times longer than any carrier plane. Flying boats must be operated from an airbase. When available they will be chosen first by the AI when it is executing recon missions. Flying boats may also be selected for bombing missions against naval or ground targets. Flying boats use the level bombing technique though they are even less accurate than medium bombers.

Flying boats are one of the first plane types to be developed. Flying boats have a secondary use during the strategic turn - they will attack enemy submarines and sink them. Operating a large fleet of flying boats can help contain enemy submarines. The monthly maintenance fee for a flying boat is about 20% higher than for single engine planes.

Floatplane scouts

Floatplane scouts can operate from most ships larger than a destroyer. They can also operate from airbases where they are handled by the AI in the same manner as other aircraft.

To operate a floatplane from a ship, the ship must be designed by the player or AI to carry a floatplane. It is not necessary for the ship to

have a catapult installed to operate floatplanes, however if a ship does not have a catapult installed the ship will need to come to a complete halt to launch the plane so it can crane the floatplane onto the sea to allow it to take off. A ship with a catapult may launch a floatplane without changing course or slowing down. Catapults are a technology that must be developed through research. Both catapults and planes must be added to the ship when it is designed or rebuilt.

All ships that recover a floatplane will need to slow down to 10 knots while the plane lands and is winched aboard.

While the primary role for a floatplane scout is search, later models may be equipped with bombs and can execute level bombing attacks, though with rather poor accuracy. They can be sent on both naval and ground strikes. The AI will take control of some floatplanes to use for search patterns but the player does have access to floatplanes that are on ships during battle and may use them for additional searches or for strikes if they can carry bombs.

The player does not allocate floatplanes to his ships manually. Rather, the game will automatically stock to capacity each ship that is equipped with floatplanes at the start of a battle. If you want your airbases to operate floatplanes you will have to allocate floatplane squadrons to them.

If ships that carry floatplanes are not equipped with a hangar, the aircraft will have lower serviceability. It is not unusual to see 50% of your floatplanes damaged at the battle's start. This is because floatplanes without a hangar were often stored in position on their catapult where they were exposed to the elements.

The Aircraft Types screen

Accessing the Aircraft Types screen

You manage your active aircraft models and request the development of a new aircraft model on the **AIRCRAFT TYPES** screen. You access this screen by clicking on the "*Aircraft types*" button on the main screen.

The Aircraft Types screen

The **AIRCRAFT TYPES** screen provides a detailed view of your aircraft models. It allows you to filter the view in various ways and can be used to view the known characteristics of enemy aircraft. You also use this screen to request new aircraft models . This process is covered in the **Aircraft Procurement** section.)

Columns in the Aircraft Types Screen

Below is a brief description of the columns in the **AIRCRAFT TYPES** screen and what they describe. The speed values shown are in knots. Distances are in nautical miles. Bomb weights are in pounds. Other numerical values such as firepower, maneuver and toughness are the attribute's value out of a total possible value of 20.

- **Name** – The name of this specific model.

- **Role** – The combat role for this model – the role defines how the plane is used in battle.

- **Year** – The year this model was introduced.

- **Max Speed** – The maximum speed this model can obtain listed in knots.

- **Cruise speed** – The speed at which this plane will fly when moving to and from a strike target listed in knots.

- **Rng lt (Range light)** – The combat radius for this model when carrying its lightest bomb load or no bombs.

- **Rng med (Range Medium)** – The combat radius for this model when carrying a medium bomb load. Listed in nautical miles.

- **Rng hvy (Range Heavy)** – The combat radius for this model when carrying its heaviest bomb load.

- **Firepower** – The firepower of this model. For bombers this represents defensive firepower.

- **Maneuver** – A rating of the maneuverability of this model.

- **Toughness** – A rating of how much punishment this model can sustain in combat.

- **Lt bomb** – The size and number of bombs that can be loaded using a light loadout for this model.

- **Med bomb** – The size and number of bombs that can be loaded using a medium loadout for this model.

- **Hvy bomb** – The size and number of bombs that can be loaded using a heavy loadout for this model.

- **Torpedo** – The loadout when a torpedo is carried. M means a torpedo can be carried at medium load, H at heavy load.

- **Carrier** – An indication of whether this model can be based on an aircraft carrier.

- **Floatplane** –Only floatplanes may be carried on surface warships other than aircraft carriers.

- **Reliability** – Reliability influences the frequency of operational losses for this model.

- **Obsolete** – Obsolete models will not be actively deployed to carriers or airbases.

Name

The model name is used to identify a specific model of aircraft. Aircraft manufacturers can improve existing aircraft models after they are put into service. When this occurs the same model name will be used but with a letter suffix appended to indicate this is a new improved version of the original model.

Role

The aircraft role will regulate its basic attributes, the type of possible missions it can fly, the type of ordnance that may be carried, and the kind of base the aircraft may operate from.

Maximum Speed

Maximum speed is primarily a combat attribute. Maximum speed is only used in air to air combat and when making a bombing attack. Maximum speed is one of the attributes that contributes to the combat value of the aircraft. High speed will also serve to protect planes that are making bombing runs by exposing the planes to AA fire for a shorter period and by making it more difficult to track the plane with AA. There is a peripheral effect, in that planes with a high maximum speed also tend to have a relatively high cruise speed.

Rng lt, Rng Med and Rng hvy

These values provide the combat range for the plane given an equivalent bomb load. That is, if

a heavy loadout (Hvy bomb) is to be carried then the plane will be limited to the "Rng hvy" range.

Firepower

This is a rating of the type of weaponry carried by the plane. For most bombers it represents the defensive weaponry of the plane.

> **Designer's notes:** *Up to about 1930 firepower was quite limited by the light construction of most biplanes. Weaponry during this period seldom varied from nation to nation and from one model of plane to the next. If you are looking to maximize your combat ability during this time you might want to look at attributes other than firepower. When monoplanes begin to enter production firepower becomes much more varied and may be a useful attribute to emphasize.*

Maneuver

This attribute represents the ability of the plane to execute effective combat maneuvers particularly during air to air combat. A maneuver value that is substantially higher than the plane's opponent in air to air combat will make the plane more likely to win the combat. A high maneuver value will also be of benefit in reducing damage from AA.

Toughness

This value represents how much damage, from air to air combat or from AA fire, that a plane can take before it is rendered unable to complete its mission – that is, the point at which it is considered "damaged" or destroyed.

Lt bomb, Med bomb and Hvy bomb

These ratings show the size and quantity of bombs that the plane can carry when ordered to carry a specific ordnance loadout. The category of bomb: SAP, AP or GP (semi armor piercing, armor piercing or general purpose)that the plane will carry is determined by the type of strike mission the plane is flying.

Carrier and Floatplane columns

These columns indicate if the plane is capable of being based on a carrier or if it is a floatplane, which can be loaded on most large warships.

Reliability

This is a rating of how likely this plane type will break down either before battle begins or during the battle, usually while landing the plane. Reliability is not readily apparent when a plane model first enters production and its actual reliability rating is revealed only after it has been operational for some time. From time to time you may get opinions from air units on the reliability of aircraft.

Prior to each battle a certain percentage of planes are placed in a damaged state to start the battle. Squadrons equipped with planes that have lower reliability are more likely to suffer damage during this pre-battle phase and will start the battle below strength. Planes damaged in this way may be repaired and put back into operation during the course of the battle.

Obsolete

This column describes if a plane is obsolete. A plane will become obsolete after a certain amount of time has passed since it was introduced. This is an automatic process that the game handles. A plane will not become obsolete in this manner if it is the only model of that role possessed by the player.

If obsolete models are assigned to squadrons when the model is marked as obsolete, the game will replace the obsolete planes with a more modern plane of the same type. This is

not an instantaneous process, so obsolete models may remain in service for a few months after they've been marked as obsolete. You may even enter battle with obsolete models on board your carriers.

The player may also mark planes as obsolete or remove a plane from obsolescence. You do this by right clicking on the model's line in the AIRCRAFT TYPES screen and selecting "*Obsolete*". This is a toggle control, so selecting "*Obsolete*" for a model that is already marked as obsolete will remove it from obsolescence.

> *Designer's note:* *By using the obsolete function you can exert some control over which of your plane models will be used to populate your active squadrons. You can mark planes as obsolete to clear the way for newer, more effective models. You can also use the function to keep older but more effective models active by marking any newer but inferior models as obsolete when they enter production. In this way you can keep active only those models that you find most useful.*

Comparing Aircraft

The "*Compare all aircraft of role*" drop down list at the bottom of the AIRCRAFT TYPES screen allows you to compare all known attributes of your own planes and the enemy's planes of a specific type (Torpedo bombers, for instance). When you select a role from the drop down list the list of planes in the display will change to show all of the planes of that type that are currently active in the game (excludes obsolete models) . This includes both friendly and enemy planes, however many attributes of enemy planes will often be unknown. Spying and combat experience will increase knowledge

about the capabilities of enemy aircraft. Note that not all the known capabilities are shown in the spy or combat experience message due to lack of space. More may be shown in the compare aircraft list.

If you have toggled on the "*Show obsolete types*" checkbox *prior* to selecting a model type to examine, the planes displayed will include every plane of that type that has been produced in the game.

Show Obsolete Types checkbox

If this box is checked then the Aircraft types screen will display every plane including all marked as obsolete. This is useful when you want to toggle the obsolete status of a particular model. It also allows you to view the progress your planes have made over the years.

The request proposals for new aircraft button

The "*Request proposals for new aircraft button*" will open the AIRCRAFT REQUIREMENTS screen and allows you to request new aircraft. This feature is covered in the next section: **Aircraft Procurement**.

Aircraft Procurement

Procurement Overview

To obtain a new aircraft model you will issue a request for proposals for the new plane, specifying the role of the plane (fighter, dive bomber, etc.) and your two preferred characteristics. You submit the request and wait for national aircraft manufacturers to provide prototypes. You then select one of the prototypes to put into production or you can reject all of them. After a further wait while the prototype's kinks are worked out, the aircraft is put into production. At this point you can start

equipping your airbases or carriers with the new model.

There are other ways you can get new aircraft models. An aircraft manufacturer may develop a new model on their own and offer it to you. As with other prototypes you can accept or reject their offering. In addition, aircraft manufacturers will continue to work on existing models and will occasionally offer an improved model of an existing plane to you, which again, you can accept or reject.

> **Designer's note:** *The RTW2 aircraft procurement system replicates. in broad terms, the historical process that navies went through to direct the development of new aircraft and procure those aircraft from aircraft manufacturing firms. Historically, navies would issue specifications that listed aircraft attributes that they would require for the new aircraft, such as maximum speed, bomb load, landing characteristics, etc. Aircraft manufacturers would try to match or exceed those specifications. Generally, several manufacturers would build prototypes that would then compete to obtain approval from the navy. The navy would put the prototypes through a series of trials and either reject all prototypes or accept one. The winning manufacturer would get a contract to put their plane into production for the navy.*

Issuing a Request for Proposals

To request proposals for a new aircraft model, you first open the **AIRCRAFT TYPES** screen. At the bottom of this screen you can click the "*Request proposals for new aircraft*" button. This will open the **AIRCRAFT REQUIREMENT** screen. On this screen you can set the type of plane proposals you are requesting as well as set your priorities for the new model.

You can only have one request for proposals active at a time. Proposals typically take several months to fulfill. This process is faster during war, and is also faster in the early period of the game.

Select the Type of Plane

You can set the type of plane you want proposals for in the "*Aircraft Mission*" drop down list. While this list will contain all plane types, some types (e.g. dive bombers) will need to be developed through research before they are available.

Select the First and Second Priorities

You can stipulate that certain aircraft attributes should be emphasized in the proposals. You top priority can be set in the "*First priority*" dropdown list. The second most important attribute you would like to see emphasized is set in the "*Second priority*" drop down list.

For instance, you may want a very durable plane with the ability to carry heavy bomb loads. In this case, you would probably want to select "*Toughness*" as a first priority and *"Bomb load"* as the second priority.

You can select the same attribute twice, to indicate that this is really the top priority. Of course, prioritizing some traits come at a cost. Other attributes may be neglected.

Prototypes

After you are satisfied with your settings you click "*OK*". At this point you will have to wait several months while the aircraft manufacturers create prototypes of the planes. When they are ready you will be presented with three prototypes to examine. These prototypes are

displayed using the same format as the **AIRCRAFT TYPES** screen so it is easy to see how they stack up against other planes. You will get to pick one of the three prototypes to put into production or you can reject them all.

If you accept a prototype it will appear in the **AIRCRAFT TYPES** screen with a (Dev) designation after its name. The plane is shown here purely as a reminder of the plane(s) you have under development; it will not be equipped by your squadrons until it enters production. At that point the (Dev) designation will be removed.

When you accept a prototype, you have in effect, entered into a contract with the plane's manufacturer to produce the plane. The manufacturer will take a few months to put the plane into production. When the plane is ready you will receive a notification and the plane will appear on the **AIRCRAFT TYPES** screen. In the next turn you will begin to see some of your airplane squadrons equipping the new model, probably replacing older models of the same type in those squadrons.

Unsolicited Aircraft Prototypes

Occasionally, a manufacturer will develop a new plane on its own without a request for proposals being issued. When this happens you will be shown the planes attributes and asked if you want to put the plane into production. If you accept, you will need to pay a development fee and the plane will go into production after a few months. You are free to reject the model if your wish.

Rarely, a manufacturer will offer a prototype that you are unable to build yourself because you have not yet developed the necessary technology. If you accept this plane you will be able to put it into production and equip your squadrons with it as normal, but you will still not be able to request proposals for the type until you have developed the necessary technology.

Updated Aircraft Models

Some aircraft manufacturers will continue to work on models that have been accepted for production. They will occasionally offer a new version of the same model with one or several improved attributes. Sometimes these advanced versions are very significant improvements over the original model, but they are always better in some way. When this occurs the improved version will have a letter appended to the end of the original model's name and it will be treated as a completely different model. There may be several improved versions developed for a single model, each being designated by a higher letter.

Aircraft Type Names

The names of aircraft types are randomly taken from a list of aircraft types used by that nation. You can change the name manually by right clicking on the aircraft type and selecting change name.

> **Designer's note:** *We are of course aware that not all nations used letters to denote improved types. If you want to number improved types, or call them Mk II, you can always change the name of the aircraft type manually.*

Squadrons

Overview

The squadron is the basic air unit in RTW2. When you assign planes to an aircraft carrier or airbase you will do so by assigning squadrons. If you want to move aircraft

from one carrier to another or to an airbase you will move a squadron. When you launch an air strike it will be by squadron.

When you create a squadron you will designate its role. Squadron roles mirror plane roles. Each squadron will have a single role and will always contain planes with the same role. As with aircraft these roles are Fighter, Torpedo bomber, Dive bomber, Floatplane scout, Flying boat and Medium bomber.

In addition, each squadron is always composed of a single aircraft type. The game will handle the process of populating your squadrons with aircraft models. During the strategic turn you can name your squadron, adjust the number of planes in the squadron, change the role of the squadron, move the squadron to another base or carrier or disband it entirely.

Each squadron is rated for the experience of its crews. Experience affects almost every action taken by a squadron during a battle.

Squadrons will gain experience with time and through combat experience. Changes to the squadron's composition, aircraft type and number and heavy losses in combat can decrease a squadron's experience rating.

The AIR GROUP MANAGEMENT **screen**

Squadrons are created, modified and moved in the **AIR GROUP MANAGEMENT** screen. This screen has two main panels. On the left is a list of all the airbases and carriers that your nation has available. Selecting one of these will give you access to all of the aircraft based at that location. On the right is a panel that is used to display aircraft squadrons and information about the squadrons for the selected airbase or carrier.

The left panel

The carriers and airbases

When you select an aircraft carrier or airbase in the left panel, all of the aircraft squadrons at that base will be displayed in the right panel.

All

If you select "All" then all of your squadrons at every airbase, carrier and in the reserve will be displayed in the right panel.

The Reserve

The reserve has no physical presence in the game. Any squadron placed in reserve will continue to train and improve in experience but cannot be involved in any combat. There is no limit to the number of squadrons that can be placed in reserve. You will pay normal maintenance fees for aircraft in reserve.

Right click menu

You may right click on any selection in the left panel to bring up a menu with options to add an air unit or automatically fill the base with aircraft. These options are covered below.

How to Create a Squadron

To create a new squadron right click on one of the airbases, the reserve, or a carrier in the left panel in the **AIR GROUP MANAGEMENT** screen. Select the "Add air unit" option. You will open a small dialog in which you pick the squadron role and set the initial number of aircraft for the squadron. Clicking OK will create the squadron. The squadron will start with an experience rating of Poor.

Auto add aircraft

When this option is selected the game will attempt to bring the base up to its maximum capacity. It will first add additional aircraft to any squadron that has fewer than 18 planes. If there are insufficient squadrons present to reach the maximum capacity it will create new squadrons.

The Right Panel

The right panel display information about each squadron at the selected base. You can drag and drop squadrons out of the right panel and drop them onto a different base in the left panel to move the squadron. The information in the panel may be sorted by clicking on any of the column headers. Here is a brief description of the right panel columns.

Role – The role of the squadron.

Aircraft Type – The exact model of aircraft that equips the squadron.

Name – Each new squadron is assigned a generic name but you can change this.

Aircraft – This column shows the number of aircraft in the squadron.

Base – This column shows the airbase or carrier (or reserve) where the squadron is located.

Experience – The experience level of the aircrews of the aircraft in the squadron.

Right click menu

You can right click on any squadron to open a menu with the following five options.

Change name – this option lets you change the name of the squadron.

Change number – Allows you to change the number of aircraft assigned to the squadron. Minimum squadron size is 4 and maximum is 20. Changing the squadron size can affect the experience level of the squadron.

Change role – This option allows you to change the role of the squadron. The squadron will swap out its planes for new ones that support the new role. This change will affect the squadron's experience level.

Move to reserve – Moves the squadron to reserve. You can also drag and drop it into the reserve.

Disband – Removes the squadron. All crew experience is lost.

How to move a squadron

You move a squadron using drag and drop. In the AIR GROUP MANAGEMENT screen you select the base that has the aircraft you want to move in the left panel. You then drag the squadron out of the right panel and drop it onto the destination base in the left panel.

How squadrons get their planes

When a new aircraft model is introduced and enters production the new models will begin to replace older models. This process is gradual and can take several months to complete. Plane models that are marked as obsolete will not be assigned to squadrons, but may remain in service until a replacement type is available.

If any of your bases are not at maximum capacity the game will ask every six months if you would like to automatically add aircraft to your base. Answering yes to this option will cause your base to be filled to its maximum capacity with aircraft in a manner similar to that explained in the "Auto Add aircraft" section above.

Aircraft totals

At the bottom of the AIR GROUP MANAGEMENT screen the total number of naval aircraft operated by the nation is shown. This total includes all floatplanes on all ships. You can compare this figure to the "Naval aircraft" maintenance costs shown on the main screen.

Also in this area, the game displays the total aircraft ASW value.

The cost of aircraft

Each aircraft requires a monthly maintenance fee. The cost to maintain one single engine plane per month is 8,000. The cost to maintain each multi-engine plane is 10,000. You can track these costs on the main screen budget area in the "Naval aircraft" field. Aircraft maintenance fees are reduced by 20% during peacetime.

Aircraft Carriers

Designing Aircraft Carriers

The design and construction of aircraft carriers (CV) are regulated by advances in the research area "Shipboard aircraft operation". This area of research will not be immediately available but will be discovered in time. You will not be able to convert ships into CVLs (light aircraft carriers) until you reach level 3 (Flight deck). Additional research in this category will allow you to design CVLs from scratch, then convert existing ships into full size CVs. Finally you will be able to design and build CVs from scratch. The AI nations must go through the same process.

Further ship design restrictions apply to the construction of carriers:

- The total displacement for an aircraft carrier may not exceed 4 times the current research level in "Shipboard aircraft operation". CVLs may not exceed a displacement of 16,000 tons and may carry no more than 34 planes.
- The first CV (not CVL) built by a nation must be equipped with at least eight 8" guns or larger. Purpose built carriers must have a flat deck on top of belt armor scheme.
- Aircraft faster than 120 knots will be restricted to light load if operating from a carrier with less than 10,000 displacement, unless the carrier has at least one catapult.
- Flight deck catapults (once researched) are limited to 2 on carriers until the angled flight deck is researched.
- CVs that carry more than 100 planes will be penalized with slower air operations, added costs, and excess weight required in the design.

> **Designers note**: *Through operational use during WWII the Americans discovered that carriers with very large air groups faced significant issues with the management of air operations.*

How to create a converted carrier

Once you have researched the appropriate techs you will be able to convert ships into aircraft carriers.

CVL conversions

To convert an existing ship into a CVL (light aircraft carrier) do this:

- You must start with a ship with a displacement under 16,000 tons.
- Use the right click "Open design for rebuild" option on the selected ship to open it in the SHIP DESIGN screen. .

- In the **SHIP DESIGN** screen on the "Flight installations, missiles" tab, check "Flight deck" and add at least 5 planes to the "Air capacity".
- Click on the "Check design" button and the game will ask if you want to convert the ship into a CVL.
- If you answer yes the game will convert the ship and you will see the "Ship type " field change to say CVL .

There will probably be other issues you will need to take care of to make the CVL completely viable, such as replacing engines to increase the ship's speed and removing centerline turrets.

CV conversions

To convert a ship into a CV do this:

The ship to be converted must start with a displacement that is within the player's current tonnage restriction for CVs (See the **Designing Carriers** section above).

- Use the right click "Open design for rebuild" option on the selected ship to open it in the **SHIP DESIGN** screen. .
- In the **SHIP DESIGN** screen on the "Flight installations, missiles" tab, check "Flight deck" and add at least 25 planes to the "Air capacity".
- Click on the "Check design" button and the game will ask if you want to convert the ship into a CV.
- If you answer yes the game will convert the ship and you will see the "Ship type " field change to say CVL .

There will probably be other issues you will need to take care of to make the CV completely viable, such as replacing engines to increase the ship's speed and removing centerline turrets.

Carrier-specific design elements

Armored Deck and armored hangar sides

An armored deck may be installed on a carrier. An armored deck will increase a carrier's resistance to bombing attacks and plunging fire from surface attacks. To install an armored deck, you adjust the "Flight deck armour" spinner in the "Flight installations, missiles" tab of the **SHIP DESIGN** screen. As you adjust this spinner you will see the cost in weight in the field to the spinners right. There will also be an added expense. A similar process is used to add hangar side armor to your ship design.

Flight Deck catapults

Flight deck catapults may be installed on any carrier after the technology has been researched. Note that this type of catapult has different effects and rules than the trainable catapults that are installed in surface ships. Flight deck catapults can only be installed on carriers. Flight deck catapults will increase the spot value of the carrier. Carriers with flight deck catapults do not need to turn into the wind when launching fighters on CAP or planes flying recon missions. The number of flight deck catapults that can be installed is limited to two unless "Angled flight deck" has been researched.

Edge elevators

Installing these will improve readying and spotting times and give a slight bonus to the spot value of the aircraft carrier.

Carrier-specific Superstructure Editor Modifications

Some changes have been made to the superstructure editor to accommodate the unique visual aspects of aircraft carriers. Secondary guns and casemate guns will not be displayed on aircraft carriers. Carriers

were often not symmetrical, so the ability to draw asymmetric shapes in the editor is now supported. This ability can also be applied to the drawing of non-carrier superstructures. In addition, guns on carriers can be arranged in an asymmetric pattern (this ability does not extend beyond carriers). Smokestacks may now be drawn off center. These abilities are enabled with new checkboxes in the superstructure drawing area of the build dialog.

There are other improvements to the superstructure editor. The number of superstructure layer has been increased from 5 to 7. In addition, the number of points that can be drawn per layer had increased to 12 for symmetric layers and to 24 for asymmetric layers. There is also a widget that tracks the XY coordinates of your mouse pointer within the confines of the superstructure editor.

Rebuilding Aircraft Carriers

There are a few considerations to keep in mind when rebuilding aircraft carriers. A large increase in the aircraft capacity will increase rebuild times. When you decide you need to rebuild an aircraft carrier you should first move the assigned air squadrons to reserve or assign them to a land airbase. If you leave them on the ship when it is rebuilt the squadrons will be disbanded.

Aircraft Carriers in Battle

Battles that include aircraft carriers will generally have a longer duration than battles without carriers. Until a separate Carrier Force is researched, carriers will be deployed into their own divisions attached to the Main Force. These carrier divisions and any screening divisions will often operate on their own, independent of the Main Force. They will try to maneuver a considerable distance to the rear of the main force.

If you have researched carrier force and there are two or more carriers in the region where the battle occurs, the carriers in the battle may be deployed in a separate Carrier Force. The player will have control over this force. With enough ships available it is possible for a nation to have a Main Force, a Scouting Force and a Carrier Force present in a battle.

In battle, aircraft carriers use special operating procedures that are quite different from other surface warships. When operating under AI control, aircraft carriers will try to keep their distance from the Main Force or from the force flagship in an attempt to avoid detection by enemy forces or a direct confrontation with enemy surface warships. Carrier divisions will generally operate between 20 and 50 nm behind the friendly leaders. They will often move to place the force flagship between themselves and the perceived location of the main enemy force.

There are also other carrier specific behaviors. A carrier that is launching a strike will always turn into the wind and go to its highest speed to launch its aircraft. A carrier will also always turn into the wind and use maximum speed when its planes are landing aboard. A carrier launching planes on search missions or on CAP missions will turn into the wind to launch its planes unless it is equipped with flight deck catapults. Carriers equipped with flight deck catapults will use their catapults when launching fighters on CAP or any plane executing a recon mission and will not need to turn into the wind. When these maneuvers occur the AI will take control of

the carrier and the player will be unable to issue movement orders even if it appears that he has control of the division. If the carrier division was operating under player control prior to turning into the wind it will automatically return to it previously ordered movement direction and speed after launching or landing its planes.

Regardless of the maneuvers of the carrier divisions or how far they may be separated from the Main Force or their own Carrier Force flagship, the player (and AI) may always issue air operations orders to his planes(assuming weather permits). In other words, the player will always retain control of his air squadrons.

Carrier Division Roles

Carrier divisions are only able to have two roles assigned – Independent and Support. If the carrier division is assigned to the Main Force the role of "Independent" will cause the carrier to operate on its own and often far from the Main Force flagship. If a carrier division is assigned to a Carrier Force, a division with a role of "Independent" will attempt to remain within close proximity to the Carrier Force flagship. In both cases, the carrier turning into the wind to operate aircraft may cause the carrier to move away from its preferred position relative to the flagship.

A role of "Support" will cause the carrier division to divide any CAP it puts up with the division that has been assigned as the "Lead formation", sending ½ of the fighters to protect the "Lead division". This is a way for a carrier to provide CAP for the main force.

Carrier damage

Carriers are more susceptible to superstructure hits than most surface warships and superstructure hits can be converted into hangar hits, which may also damage or destroy aircraft on board. Carriers will be more susceptible to damage and fire when there are readying planes on board.

A carrier that has more than 40% superstructure or flotation damage or is on fire may not operate aircraft. You will get a message to that effect.

Damage to a carrier will make air operations like readying and spotting slower.

If aircraft are out of fuel and unable to land on their carrier, they will ditch. Note: This is a simplification. In reality they would try to divert to other carriers or land bases, but in the scope of an RTW battle they would likely not take any further part in the battle.

Misc. Carrier information

- A carrier's operational status (Active, Reserve, etc.) can affect the experience rating of its air group.
- Flight deck catapults will increase a carrier's spot value and slightly reduce spot times.
- All CVs and CVLs have an intrinsic ASW value. This value is initially low but will increase as various technologies are researched, such as aerial depth charges and airborne radar.
- The research area "Shipboard aircraft operation" may not have its priority set to high until the nation has constructed a carrier.

Seaplane Carriers

Seaplane carriers (AV) are warships designed to carry a load of floatplanes and operate those planes at sea. Seaplane carriers may only be equipped with

floatplanes, they cannot carry wheeled aircraft. You will not be able to design seaplane carriers until you have reached level 1 in the research area "Shipboard aircraft operation". Seaplane carriers may be equipped with guns and torpedoes like other ships. There are no restrictions on the size of a seaplane carrier or the number of floatplanes it may carry.

A seaplane carrier (or any ship) may be equipped with a seaplane hangar. The cost of this installation will vary depending on the number of floatplanes carried. A seaplane hangar will increase the serviceability of aircraft on the ship.

You do not need to create floatplane squadrons and then assign them to a seaplane carrier. The game will automatically populate your seaplane carrier with floatplanes to whatever air capacity level you have installed during the design process.

Once invented, catapults may be installed on seaplane carriers. Any ship, including an AV, equipped with floatplanes that does not have a catapult must come to a complete halt to launch those floatplanes. Any ship equipped with both a catapult and floatplanes does not need to stop, slow down or turn into the wind to launch its floatplanes. Any ship recovering a floatplane after a mission will need to slow down to around 10 kts while the floatplane lands and is hoisted aboard the ship.

During battle, the floatplanes on a seaplane carrier (or any other ship) operate in almost identical ways to the operation of planes from an aircraft carrier. Using the **SET UP STRIKE SCREEN**, floatplanes may be assigned to ground or naval strikes or sent on recon missions. Floatplanes may not be assigned an escort mission.

AI nations will reduce the construction of AVs and their use in battle after about 1930.

Land based Air

Overview

Players and the AI can build Naval Air Stations and airbases to allow them to operate naval aircraft from land bases. There are specific locations provided on the map in which these facilities can be built, generally the same as your naval bases, though there are some locations that are airbases only. Naval Air Stations and airbases operate in an identical manner; NAS are simply airbases that exist in the national homeland. "Airbase" will be used from this point on to represent both.

Each airbase is rated for its maximum aircraft capacity. The capacity of a newly built airbase is 20 airplanes. The maximum aircraft capacity of 120 aircraft becomes available only after technological advances in Naval Aviation, Heavier than air. Aircraft capacity can be increased, up to the currently allowed maximum capacity, by paying to expand the airbase in increments of 20 planes per expansion

The player is in charge of adding and maintaining air units based on his airbases. However, the AI controls air operations from land airbases during battles, with a moderate amount of pre-battle direction from the player.

During the strategic turn you as the player can modify air units, rename them, resize them or change their role. You can move them from one base to another base or even to and from a carrier, if the planes are carrier capable. The player does not have control of the specific type of aircraft operated by an air unit. Aircraft are

replaced automatically when a new model becomes available, but at a random pace, so some units may be operating older types for a while.

You will make the decisions about where and when to build a new airbase or expand or demolish an existing airbase. You are also responsible for paying maintenance for the national naval airbases you have built and for the aircraft that populate them.

During battle, airbases are controlled by the AI. The player has no control beyond ordering a preference for land or naval targets at the start of a battle. The AI will follow your directions, but not slavishly. Airbases operate in a manner that is very similar to aircraft carriers and have almost identical restrictions and procedures. Airbases go through the same readying and spotting as on carriers and the same missions are available to each, though in contrast to carriers, the operations at land bases will always be handled by the AI.

Though land based air is controlled by the AI during battles, their squadrons are shown in the **AIR FORMATIONS** screen alongside the carrier based squadrons controlled by the player. On this display you can keep track of what the land based air is doing and watching each squadron being assigned missions and going through the many different statuses such as readying, taking off and attacking.

 Carrier capable planes (torpedo bombers, dive bombers and fighters) can operate out of either airbases or carriers interchangeably. Only airbases may operate medium bombers and flying boats. Floatplane scouts can operate from airbases, floatplane carriers or other ships equipped with floatplane facilities.

How to build an airbase

To build an airbase open the **MAP** tab and click on a possession. Click on "Build fortification" and then scroll down and select the "Airbase" option. Click the Location drop down and select the specific location to build the airbase. You will see the time required to build the airbase and various costs detailed. Click OK to start the build process. You can also accomplish this by clicking on the **Build Fort/Base** button on the main interface.

When the airbase is complete you will be notified and you will be asked if you'd like to automatically populate the base with aircraft. You can also do this manually at any time during a strategic turn. The new airbase will have an air capacity of 20.

How to expand an airbase

You expand an airbase on the **COASTAL FORTIFICATIONS** tab. After opening this tab, you will see a list of fortifications including your airbases. To expand an airbase right click on the airbase's line and select the "Expand base" option. If the base is not at the current maximum capacity for your navy you will see the status change to "E-4" or a similar number, which indicates the number of months before the expansion is complete. The" Costs" column will show a new monthly cost for the expansion. When the expansion is complete you will be notified and the airbase's capacity will increase by 20.

The maximum size for a nation's airbases is based on the current level of research achieved in the "Naval aviation, heavier than air" technology field.

As an alternative method you can use the **BASE OVERVIEW** tab on the main screen where all

possessions and bases controlled by the player are listed. A simple right click on any location will allow you to build or expand multiple airbases airbase or improve multiple naval bases very quickly..

How to add or remove airplanes from an airbase

You add and remove squadrons from an airbase as explained under Air Procurement and Management section above.

Setting the target priority for airbases

Prior to the start of each battle the game will ask you to set the type of target you want your airbases to attack during the upcoming battle. The choice offered is normally between naval target or land target, and occasionally to focus on the objective. The AI will attempt to attack your preferred type of target but it may also attack other targets.

Airbase activity during a battle

Airbases will conduct extensive searches that utilize, by preference, flying boats, floatplane scouts, medium bombers and finally any other available planes. Generally they will select the most long ranged aircraft for searches. Flying boats are especially adept at long range searches over areas of the ocean that are suspected of containing enemy naval forces. Sighting reports from land based air searches will be available to the player, but with some delay.

Designer's Note: *Though you do not directly control airbases during battle, the decisions you make prior to battle will have a strong influence on the effectiveness of your airbases during battle. You must make sure they are stocked with the appropriate planes for the missions that are expected. If your base is within range of an enemy airbase, fighters are critical to prevent your base from being rendered ineffective by enemy air attacks. You'll want to provide your bases with flying boats that give airbases their eyes (and kill submarines between battles). You'll need to stock your bases with bombers to give them teeth. Even deploying early biplanes, making the right choice about the types of squadrons to operate from undersized bases can tip a battle in your favor. Later, large airbases filled with long range naval bombers can become decisive battle-winning weapons.*

Airbases will carry out attacks against land targets, typically other airbases, and against naval targets. To carry out an air strike the airbase goes through the same series of steps that the player goes through when preparing to launch a strike from a carrier.

Airbases will also put up CAP. In regions where airbases are within range of each other's bombers there will usually be a lively exchange of attacks as each side attempts to suppress the other's air power during a battle.

Airbases and ASW

Airbases serve to suppress and sink enemy submarines. The ASW value of an airbase depends on the number of flying boats stationed there, with each flying boat contributing to the overall ASW effort of your side during wartime.

Airbase Costs

The cost to build a new airbase is shown on the BUILD COASTAL FORTIFICATION screen when you select an airbase from the list of available fortifications. This screen will also show the monthly maintenance fee. The maintenance cost is the same for all airbases regardless of the airbase capacity. Airbases that are not in the homeland cost 20% more. Larger airbases cost more to maintain.

> *Designer's Note:* *Note that the maintenance of bases is only a small part. Maintenance of the aircraft is more expensive and can eat up a substantial part of your budget. If you create a large number of airbases and fill them all with the maximum number of planes, you may find it a severe drain on your budget. It can be better to keep some bases populated with a small number of aircraft and move in more aircraft when needed for operations in the area.*

Automated restocking of planes

Every few strategic turns the game will offer to automatically fill your airbases or carriers with planes. If you accept this offer the airbase or carrier mentioned will have the number of plane in its squadrons increased until the carrier or base's capacity is reached. In some case if there are insufficient squadrons at the base or carrier the automated system will add squadrons to bring the base or carrier up to capacity. If you reject the offer the game will not make additional offers until several strategic turns have passed.

Aircraft operations and weather

Light or heavy mist, low clouds and any type of precipitation will hinder air operations. Aircraft will not take off and any aircraft already in the air will return if the bad weather persists. Aircraft in the air will have lower chances of finding enemy ships and reduced accuracy in attacks. Aircraft landing in bad weather will suffer increased operational losses.

Heavy seas will stop floatplane operations and increase operational losses for all aircraft.

The Air formations screen

The Air formations screen (hereafter referred to as the AF) provides a detailed minute by minute description of the state and condition of your air squadrons. The AF reports on the activities and states of all of your aircraft, even land-based aircraft that are controlled by the AI during a battle.

Basic Air Formations screen functionality

The AF is adjustable. You can adjust the size of the AF both vertically and horizontally and you can also adjust the individual column size. Changes that you make to this display will be remembered by the game. The AF will remain open and functional even if other displays are activated, such as the Air Strike screen. When you double click on any line in the Air formations screen the map will be centered on that aircraft.

The AF can become quite crowded with aircraft. For this reason there are three checkboxes at the bottom of the AF that allow you to filter aircraft that are on recon or CAP missions (which are largely handled by the AI) or remove planes that are in an Unready state. This allows you to narrow the focus to the specific activity you are interested in, such as viewing only aircraft

that are readying for or actively engaged in strikes.

Air Formations Columns

The first column in the AF, which is titled **Type**, lists the role and model of plane about which the line is reporting. Sometimes this column lists an entire squadron, but this column can also show individual planes or airships, as well as sections of 2 or 3 planes that are flying CAP, recon or escort missions. The format used is to first list the role and then show the model of plane, such as *MB Piaggio P. 165,* indicating that all of the planes described on this line are medium bombers of model Piaggio P.165.

The second column, labeled **OK/Dam/Dest**, shows the current condition of all the aircraft in the squadron or section using this format: 9/2/3 which translates as: 9 planes undamaged/2 planes damaged/3 planes destroyed.

The **Mission column** describes the type of mission the squadron has been assigned. Missions can be assigned by either the player or the AI. See the section titled **Air Missions** for more details.

The **Base column** shows the naval air station, airbase or ship that launched the aircraft.

The last column, titled **Remaining range**, is actually a countdown of the remaining endurance in minutes for the squadron. Each minute of game time (one turn) will expend 2 points of the squadron's endurance. For search planes, when their endurance drops to ½ they will turn around and return to base. (Planes on a search mission will also generally return home in time to avoid landing at night, even when they have remaining endurance.) A

squadron on a strike mission that does not find a target to attack will generally search the area for a target until its planes have just enough endurance to return to base, even if this will cause the squadron to land after night.

The **Status column** describes what the squadron is currently doing. There are 11 different statuses for a squadron as described below.

- **Unready** –The squadron is stored on deck or in a hangar in an unfueled and unarmed state. Unready planes are not a significant danger to the ship if they are hit by a bomb.

- **Readying –** The squadron is being armed and fueled in the hangar. This process can take some time. For sea based aircraft a mission and ordnance load for the squadron is generally selected by the player using the Air Strike screen before readying occurs, however the AI will also automatically ready some sea based planes for Recon and CAP missions. Land-based squadrons that are controlled by the AI go through the same process to prepare for a strike.

- **Ready** – When each plane in a squadron has been fueled and armed the squadron is considered ready. In this state the squadron's planes, now completely fueled and armed, but still in the hangar are very susceptible to damage from enemy attacks. Readied aircraft substantially increase the risk of a fire if the carrier is hit. Ready squadrons may remain in a ready state indefinitely. Ready squadrons can be assigned to a strike at any

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time or they can be ordered to stand down, sending them back to the hangar to be disarmed and defueled.

- **Spotting** – When a squadron is assigned to a strike its status will change from Ready to Spotting. Spotting represents the process of bringing each plane from the hangar up to the flight deck and positioning it on the deck in preparation for a takeoff. This is the point at which the aircrews will board the planes. As part of the spotting process, engines are started and warmed up for some time before the planes can take off.

  Note that sometimes aircraft will have to wait for a previous strike to take off before they can begin spotting. If a strike ordered to take off remains in ready state, this is probably the cause.

- **Spotted** – Spotted status indicates that all of the planes in the squadron have been moved into position on deck, with their crew onboard and their engines warmed up. They are ready to take off and generally will begin taking off in the next turn.

- **Taking off** – The squadron is taking off. This will take several minutes depending on the size of the squadron. When planes are taking off from a carrier it will normally turn into the wind. A carrier equipped with flight deck catapults can launch planes on search or CAP missions without turning into the wind.

- **Flying** – Once the last plane in a squadron has taken off the squadron's status will change to

Flying. For a squadron on a strike mission, its status will remain Flying until it locates a target and begins to initiate an attack. Squadrons on Search missions will have a Flying status until they reach the end of their search range. Planes flying CAP will have a Flying status until they are Landing.

- **Attacking** – A Squadron that is about to attack or is currently attacking will show this status. Most attacks take several minutes to execute. See section titled **"The Air Strike Attack"** for more details.

- **Returning** – After the last section of a squadron executing a strike has completed its attack, the squadron will assume a Returning status and fly back to its base. This status will also apply to scout planes returning from a search mission and occasionally for CAP planes returning from distant CAP coverage over a supported force.

- **Landing** – Squadrons that reach their home base or carrier will begin landing. Landing can be a particularly hazardous activity and is where many operational accidents happen, especially in adverse weather or night conditions. A carrier will always turn into the wind when a squadron is landing. Floatplanes will cause their home ship to slow down to 10 kts while they are landing and being hoisted aboard.

- **Striking below** – Immediately after a squadron has landed, the squadron's status will change to Striking Below as the carrier or airbase moves the planes to the hangar. Once the

striking below process is completed the squadron status will change to Unready and it will be available for another mission.

Aerial Search

Overview

Carriers and airbases will conduct aerial searches during a battle, sending planes flying in specific patterns in an attempt to locate enemy ships and report that information to the player or AI. This process is semi-automated. The player will designate a section of the map that he wants to search. The game will then automatically assign planes to execute the search using planes located on the player's (or AI's) ships and airbases.

Selected planes will fly out along a vector determined by the game but guided by the search pattern set by the player or AI. If the searching plane sights enemy ships it will send a sighting report back to the player or AI. The plane will continue along its flight path until it reaches the designated distance from the airbase or carrier. It will then turn around and fly back to its base, continuing to search as it flies.

Setting up a search pattern

Before you can assign a search pattern to a force you must first select a force or airbase. To select an airbase you will need to open and select the airbase on the **OB** tab.

A search pattern may then be assigned by pressing the button labeled "**Handle CAP and recon**", shown below. This will open the **ROUTINE AIR OPS** screen.

ROUTINE AIR OPS screen

The **ROUTINE AIR OPS** screen provides several controls for setting the size and type of search to execute. In the "Search pattern" section of the screen are three spinner controls that let you set the width of the pattern to search and the maximum distance from the base that the searching planes will fly. As you adjust these spinners you will see the search pattern, which will be drawn in red on the map, move to reflect your changes.

The originating point of the search pattern is centered on the flagship of the selected force, but there may be ships that contribute planes to the search effort that are many miles from the flagship.

On this screen you can also select a "Two phase search". This type of search will send out an initial wave of searching planes and will follow it in a few minutes with a second wave of searching planes along the same vector. This technique must be developed through research before it can be used.

Designer note: *The intent of a two phase search was to spot any ships that stray into the search pattern after the first plane has passed over the area. This technique was often used to allow the first wave of planes to "steal a march" by gaining some distance from the ship in the early dawn hours before there was enough light to effectively search.*

Once you are satisfied with your search parameters, click "OK" to set the pattern. The game will automatically assign the correct number of planes to search the pattern. The planes assigned to a search mission may come from any ship in the force. The game will generally assign one

plane to every 20 degree segment that needs to be searched.

Search Operational Issues

Search is not always reliable. Search planes are subject to the same operational failure issues as other warplanes. Floatplane scouts in particular are prone to mechanical failures. A plane aborted for mechanical reasons may not search all or any of its assigned segment. Planes on recon missions can also veer off course.

Planes assigned to recon missions by the game will always ready, spot and fly as solitary planes. The game will not send out plane pairs or squadrons on recon missions.

Planes on recon missions may be attacked and damaged or shot down by enemy fighters if they are spotted. Planes on recon missions will not attack enemy ships, however they may attack enemy submarines they sight. Planes on recon mission do not currently engage in shadowing tactics; they will report a sighted force and then continue on their assigned course.

> **Designer's note:** *The player should pay attention to any attacks on his recon planes, which can provide vital clues to the location of enemy carriers.*

How planes are selected for search missions

If a search is initiated by a naval force, search planes may be drawn from any ship assigned to that force. The type of planes selected for search will vary depending on the types available and how you have set the "**Floatplane search priority**" setting in the **DOCTRINES AND TRAINING** screen.

Planes will be chosen for recon missions in the following order.

For land airbases: PB, MB, FS, TB, DB, F

For Carrier forces (with "Floatplane search priority"): FS,TB, SB, F

For Carrier forces (without "Floatplane search priority"): TB, SB, F, FS

Floatplane search priority

You can find the checkbox for "Floatplane search priority" on the **DOCTRINE AND TRAINING** screen.

If the "Floatplane search priority" is checked, floatplane scouts will be used for recon missions from naval forces in preference to any other aircraft type. If there are insufficient floatplanes available then other plane types might be assigned to search missions. If this option is not checked then carrier planes will be preferred for search from carrier forces.

When Search is possible

The game will only execute one automated pattern search per day. If the battle is long enough a second automated pattern search will be executed at dawn of the second day. You cannot manually initiate a pattern search.

An automated pattern search will be initiated on turn 1 of any battle (unless it is near twilight or full dark), so it is critical to set each of your desired search patterns on turn 0 prior to running the first turn of the game. Changes after this point do not affect planes that have already been assigned to a Recon mission.

If the battle is long enough to enter a dawn period the game will execute another pattern search at dawn. You will want to make adjustments to the search parameters in advance of that happening.

Search as a strike mission

Players may also manually order planes to fly a recon mission using the same system he uses to order an airstrike. A recon mission can be flown by any plane type. The player orders the plane to Ready with a Recon mission selected. The plane can fly recon with any bomb load, but a light load is usually selected because the plane will not launch a bombing attack while on a recon mission.

You would normally use just a single plane for a recon mission and but you may assign multiple planes to the same recon mission. Multiple planes will fly as a group but in every other way follow recon mission protocols.

The player will need to set a target location for a strike search. Once launched the search plane will fly directly to the target location and then turn around and return to its carrier.

Once ordered to launch a recon mission follows the normal strike procedure of spotting, take off and flying. You can create an ad hoc search pattern by launching several planes using a similar distribution pattern.

Sighting reports

A sighting report is a brief message that reports on the number and types of ships sighted, as well as the location of the force, the direction it is moving and its approximate speed. The report also includes the time of the sighting and the identity of the reporting source.

Any of the information mentioned above can be inaccurate in a sighting report.

Viewing sighting reports

There are three locations where you can find sighting reports, the REPORTS tab, the "Targets" drop down list on the SET UP STRIKE screen and on the battle map itself in the form of labeled icons.

The REPORTS tab shows a list of all sightings that have occurred in this battle. The sightings are arranged in chronological order of when the sighting was received with the most recent at the top .

Below is a typical sighting report followed by an explanation.

14 11:39 1 TR COURSE NNW – RECON #85

11:39 – The time that the sighting occurred (This is not the same as the time the sighting was received.) The sighting time may not be available in which case 00:00 is shown instead.

1 TR – This is a description of the number and type of ships sighted.

Course NNW – This is a general description of the direction that the sighted force was moving at the time of the sighting. This information is also shown on the map in the form of a line drawn from the site of the sighting along the path that the force was moving when sighted.

Recon #85 – This shows the source of the sighting.

Delays

All sighting reports from aircraft are more or less delayed. The delay is reduced by developing the CIC.

Sources of sighting reports

Sighting reports can arise from several sources. Planes executing a strike may report enemy ships. Submarines may provide a sighting report but surface forces

will not. Bases and batteries may generate a sighting report. The most common source of a sighting report is from a plane that is flying a recon mission. When a plane sights an enemy naval force it will usually attempt to report the sighting. Planes with a recon mission are more likely to report a sighting.

Combat Air Patrol (CAP)

Overview

In RTW2 CAP is largely handled by the game's AI. The player only has to set the strength of the CAP. Note that there is a downside to a strong CAP in that fewer fighters will be available for escort and offensive operations.

The game will attempt to set an air operations schedule for the available fighters that will allow the task force to maintain a constant patrol over the task force. Fighters will remain aloft on patrol over the TF and then land to be refueled. Part of this process involves turning the carrier into the wind for most take offs and all landings. All of this is handled automatically by the game. Changes to the CAP settings in the course of a battle will take effect with some delay if existing CAP is already in the air.

Setting CAP levels

The controls for setting CAP are on the ROUTINE AIR OPS screen. This screen allows you to set the percentage of available fighters that will be devoted to CAP. There are 4 levels you can set ranging from Light to Maximum. A setting of Maximum will cause the carrier force to devote around 50% of the available fighters to CAP. This screen also allows you to set search parameters.

All carriers within a force will contribute fighters to the CAP mission,

Distant CAP

If a carrier division is assigned the "support" role, it will fly distant CAP over the supported division, that is, the division set as Lead Formation. The carrier division will then begin to send fighters to the supported division and will attempt to maintain a constant CAP over that division. This will occur even if the supported division is quite distant. It should be noted that the control for ordering distant CAP are set per carrier division while the density controls for CAP are set for the entire Carrier Force.

Carrier divisions assigned a support role will hang back several nautical miles behind the supported division, in contrast to other ships with support role, which will tend to stick near to the supported division.

Other factors that affect CAP

If a nation has researched the **Flight deck catapults** technology the nation may install flight deck catapults. Once installed, this equipment will allow a carrier to launch fighters on CAP, and planes assigned to Recon missions, without the need to turn the carrier into the wind. Carriers will always turn into the wind to recover all planes.

There are several other procedural and technological advances that increase the effectiveness of CAP through research.

CAP and combat

The purpose of a combat air patrol is, of course, to protect the nation's ships and assets from aerial attack. Fighters assigned to CAP will patrol the general vicinity of the ship or base they have been ordered to protect. If enemy planes come within range

of the CAP fighters the fighters will attempt to engage and destroy the enemy planes. These engagements are somewhat random, depending in part on the particular location of the fighter patrol in relation to the attacking planes and other factors, such as advanced fighter control methods that can be developed via research. Air to air battles can therefore occur before or after the attacking planes complete their air to surface attacks. If the air to air engagement occurs prior to the attacking planes releasing their ordnance any results of the engagement will be applied before the attacking planes can drop their ordnance.

Air to air combats occur at the squadron level, that is, one squadron or section of a squadron is pitted against an enemy squadron or section. The results an air to air combat can range from no effect to damage of the plane to aborting the attack mission to outright destruction of enemy planes.

The results of an air to air combat can impact either the attacking planes or the defending planes. Each individual plane that is damaged, killed or aborted will be shown on a separate line in the log.

- No effect - If there is no effect from the combat then no air results will be shown.
- Damaged planes may attempt to attack the target but with reduced effectiveness. Damaged planes are more likely to crash and be destroyed upon landing.
- Destroyed planes – The plane (and maybe the pilot) is destroyed.
- Air combat will also inflict disruption on both attacker and defender. This will reduce their effectiveness in further air

to air combat and their accuracy in attacks on ships.

CAP fuel and ammo

A fighter squadron can engage in several air to air combats before the squadron exhausts its ammo supply. More experienced squadrons are able to engage in more air to air engagements before running out of ammo. When a squadron runs out of ammo it will stop intercepting enemy planes and will land to rearm. Low fuel reserves will also cause a squadron to return to base and land. This will be more common for fighters flying distant CAP.

Setting Up an Air Strike

Synopsis

To set up an air strike you first access the SET UP STRIKE screen and select the ship division you want to use for the strike. This will show a list of available squadrons that are on ships assigned to that division and allow you to select and set up squadrons for a strike.

You can order a strike from either planes in an unready state or from a ready state. If you order unready planes on a strike, they will automatically first ready and then spot and take off. If you want to ready planes first, it will be a two step process.

If you order ready planes on a strike, the process will of course be much faster, but having ready planes aboard constitutes a fire hazard.

To order a strike or ready planes for a strike, select the squadron and set some parameters such as the type of mission planned, the number of planes to ready, and the bomb load that will be carried. When the squadron's

settings are where you want them you press the "Ready strike" button if you want the planes to ready, and launch strike if you want them to ready and launch.

Accessing the Set up strike screen

You get to the SET UP STRIKE screen by clicking on the AIRSTRIKE button (a lightning bolt) in the rightmost row of buttons at the top of the battle screen.

Selecting the Ship Division

The first thing you will want to do is select the division of ships that carry the planes you want to use for your strike. You do this using the drop down SOURCE DIVISION list in the lower left corner of the SET UP STRIKE screen. Note that divisions only carrying floatplanes will also be in the list.

Selecting and Adjusting Squadrons

You can change several squadron parameters prior to readying or launching a squadron on a mission. You can adjust the type of mission that will be flown, the number of planes from the squadron that will participate in the mission and you can change the type of bomb load that the squadron will carry. When you make these adjustments the squadron's line will be highlighted. This highlighting does not mean that the squadron is "selected". To "select" a squadron you must check the squadron's checkbox at the left end of the line. Only squadrons that are selected via their checkboxes will be acted on when you click the READY STRIKE or LAUNCH STRIKE buttons.

Spotting Value

Each carrier is assigned a spot value that represents the maximum number of planes that may be spotted on deck and launched efficiently as part of the same strike. You will find this value in the Spot column displayed in this format: 15/22, in which 15 is the number of planes currently assigned and 22 is the maximum that can be assigned. The spot value will change as you add or subtract planes. You may select any number of planes to send on the strike but the strike cannot exceed the carrier's spot value. If you assign more than the spot value, you will get a notification in the upper right corner of the SET UP STRIKE screen that deckload is exceeded. You cannot launch a strike if it exceeds the carrier's spot value.

Changing the type of mission

You can set the type of mission for a squadron by right clicking on the section of the squadron's line that is under the MISSION column heading. Available missions include Naval Strike, Ground Strike, Escort, and Recon. Each plane type will default to the most common mission for its type unless you change the mission. Some missions may not be available because the selected plane type cannot execute that type of mission.

Adjusting the number of planes that will fly the mission

To change the number of planes in this squadron that will be launched for this mission, right click on the section of the squadron's line that is centered below the **#** symbol. Planes that are not sent on the mission with the rest of the squadron will be spit off into a separate squadron section that must remain inactive on the carrier. These separated sections will get their own line on the display. This ability will let you fine tune your strike to remain within the carrier's spotting value.

Setting the ordnance loadout

Most planes can carry bombs of some sort. You can select light, medium or heavy loadouts for bombs and for some plane types you can also

select torpedoes. The actual bombs that these loadout levels represent will vary greatly between plane types and different models within a type. A heavy load for a fighter might be a 250 lb bomb, while a heavy load for a medium bomber might be two 1,000 lb bombs. For each squadron you can see what each of these loadout sizes represents on the right side of the SET UP STRIKE screen.

Range is strongly affected by the size of your plane's loadout. The combat range for your squadron, for each loadout, is listed just to the left of the bomb loads. Torpedoes can be either heavy or medium load, indicated by an "M" or "H" in the "Torpedo" column. The actual load requirement for a torpedo will vary depending on the performance of the aircraft type.

You can set your loadout (and your combat range) by right clicking on the section of the squadron's line that is centered under the LOADOUT label, then select a loadout for this squadron from the drop down list.

Selecting a target

Before you launch a strike you will want to select a target for the strike. There are two ways to do this on the SET UP STRIKE screen. In the upper left corner you will find a drop down list labeled TARGET. Opening this list will show all available enemy ship sightings, as well as ground facilities that can be targeted.

If you select one of the ship sightings you will taken to the map, centered on the sighting icon, which in most cases will also show a vector line indicating the last known direction in which the naval force was moving as well as an estimate of the distance the force was likely to have traveled since the sighing. This is presented as a vector line, with the length of the line representing the estimated position based on

the sighting information. You can look at several sightings but only the last selected will be used as a target.

An alternative method for selecting a target allows you to pick any spot on the map. To do this you click on the small target button just to the right of the Range field. This will clear the screen to show the map. You can then click anywhere on the map. When you click, you will set the target location and the SET UP STRIKE screen will reappear.

IMPORTANT: If you want to attack a ground target you must select the ground target from the drop down target list. If you simply select a position near or at the ground target on the map the strike will likely not find the target.

Using either method will reset the LOCATION field to show the Lat Long coordinates for the target. It will also update the RANGE (NM) field to show the range to the target. Finally it will reset the TIME AT TARGET and LANDING TIME fields to show when your strike is estimated to reach the target and when the strike is expected to return to the ship. Both of these figures are estimates and based on everything going according to plan, so take that into consideration. These values reflect the current number of planes in the strike and whether it is coordinated, so changing those parameters can change the time at target and landing times. Landing at night can cause excessive operational losses so it is important to keep an eye on the landing time.

Coordinated strike

Selecting THE COORDINATED STRIKE checkbox at the top of the SET UP STRIKE screen will cause all of the selected squadrons to remain together during the flight to the target and they will execute a coordinated attack at the target. A

coordinated attack will reduce the damage and disruption inflicted on the striking planes by the enemy AAA. It is also much more likely that escorting fighters will be able to protect the bombers in the raid from enemy fighters. However, it can take considerable time for the coordinated strike to form up over the carriers before moving off toward the target. In addition the strike will move at the speed of the slowest plane in the strike. Both of these restrictions will add considerable to time for the strike to reach the target and return to base.

Surprise air attack

Under some circumstances, you may be able to execute a surprise airstrike from your carriers on an enemy port. In a surprise attack, all airstrikes ordered on the first turn of the game only will skip the readying and spotting stages and take off immediately. Such airstrikes should pick a target location in or close to the enemy port.

The defender in a surprise attack will not fly CAP or recon until the enemy is spotted or they are attacked.

Action buttons

Ready Strike button

When preparing to ready one or more squadrons and you are satisfied with the settings for each squadron and have selected the squadrons by checking their checkboxes you can press the READY STRIKE button and the planes will be taken in hand for the readying process. Squadrons that are being readied will disappear from THE SET UP STRIKE screen. Once the readying process is completed the planes will reappear in the SET UP STRIKE screen and will be ready to spot for a strike.

Launch Strike button

After you are satisfied with the strike settings for the squadrons and its target You can click the LAUNCH STRIKE button at the bottom of the screen. This will initiate the strike process. Squadrons that are being spotted for a strike will disappear from THE SET UP STRIKE screen. Once the spotting process is completed the carrier will turn into the wind and the air strike will be automatically launched.

> **Designers note:** *Launching strikes directly involves less hassle and allows you to concentrate on other aspects of the battle. The downside of this method is that you must select the target at the beginning of the readying process, which means the target will have over an hour to move out of the targeted location before your strike arrives.*
>
> *Using the two step process of first readying and then launching involves more micromanagement, but also gives you more control, and more opportunity to react to new sightings or other developments.*

The Stand Down button

The stand down button can be used to send any selected ready squadrons back to the hangar where they will be unloaded and defueled and placed in an "unready" state.

Aircraft Data button

The AIRCRAFT DATA button will bring up the AIRCRAFT TYPES screen, allowing you to examine the statistics for each of your planes and some enemy planes. See the section on the **Aircraft Types** screen.

The Air Strike Attack

Overview

After a squadron is launched on a strike it will typically take a few minutes to form up, often moving in a direction that does not approach the enemy. This process can take longer if the squadron is part of a coordinated strike.

Once formed up the squadron will move off toward the target location at its cruise speed. The squadron will be visible to the player as a red dot on the map, or as a labeled airplane icon if the screen is zoomed in sufficiently. Squadrons are typically represented by a set of 3 plane icons, while a group with one or two planes will be shown with one or two airplane icons.

The location of a squadron is only approximately represented by the squadron's icon. The squadron may be concentrated together into a tight formation or it may have separated into individual sections while it is approaching the enemy or conducting an attack. The actual aircraft associated with a squadron may be spread over a large area and different sections of the squadron may, in fact, target and attack different ships.

If the squadron discovers enemy ships on its way to the target location, the squadron may opt to attack these ships rather than fly on to the target. Once it reaches the target location the squadron will search for enemy ships to attack. If it does not immediately find targets the squadron will initiate a search pattern in an attempt to locate the enemy. This search will continue until a target is found and attacked or until the squadron runs low on fuel and must return to base. The squadron will return if it risks a night landing.

When a squadron locates an enemy force to attack (or when enemy aircraft are approaching your ships) you will be informed of the impending attack by a billboard message.

This message often fires several minutes before the aerial attacks actually begin. Once this message appears you will be able to locate both the specific attacking squadron and the general location of the attack by accessing the AIR FORMATIONS screen. The attacking squadron's status will have been changed to read "Attacking". Double clicking on this squadron's line in the AIR FORMATION screen will center the map over the approximate location of the attacking squadron.

After the squadron closes on the target ship, which may take several minutes, the squadron will initiate an attack on the target as described below.

Air to air combat

If enemy fighters are in the air in the vicinity of the target of an air strike, air to air combat may take place. An air to air combat pits fighters on one side against enemy planes of any type on the other side. Air to air combat may occur before or after a bombing attack.

The following snippet shows two separate air to air attacks initiated by the same fighter squadron on CAP. You'll notice that the squadron's strength is 8 planes in the first combat, but it loses 2 planes to the enemy medium bombers in that fight, so has only 6 planes available when it engages a second medium bomber squadron 4 minutes later.

Unlike bombing attacks, in air to air combat, squadrons are not broken down into sections for the attack, rather the entirety of the fighter squadron that is present will engage an entire

enemy squadron. A single fighter squadron can engage in multiple air to air combats over the course of an enemy strike.

An air to air combat is first announced in the log on one line and then the following lines will list any planes that have been damaged or shot down during the combat. Apart from losses, air to air combat will also cause disruption to the involved squadrons, which will adversely affect any further air combat or bombing attacks. If no results follow the announcement of the attack then no planes have been damaged or shot down in the attack. Damaged and shot down planes can be monitored in the **AIR FORMATIONS** screen.

If a fighter that is carrying bombs is attacked it will jettison the bombs prior to the air to air engagement.

Aerial bombing attacks

An attack by aircraft is resolved in a series of attacks by individual sections of the squadron. For purposes of an attack a section can consist of 1 to 5 planes. This means that an air attack by a single squadron will typically play out over several game turns as each section executes its attack. When several squadrons are attacking there may be several section attacks displayed in the log in the same turn. Each attack will be resolved before the next section attack is displayed and resolved. A single squadron may initiate attacks against more than one enemy ship.

How air attacks are displayed in the Log

Attacks against naval targets and land targets follow the same procedure. The following snippet from the log shows a typical log display of an aerial attack; this one shows an attack against naval air station Le Havre which suffers one bomb hit from a section of torpedo bombers using level bombing. The details will be explained below.

Double clicking on the attacking planes will center the map on the location of the bombing attack.

Antiaircraft Artillery

As each squadron section attacks, the defending ship will first have a chance to fire at the section with its AAA. Each size of AAA - heavy, medium and light, fires separately and may have different effects on the attacking aircraft.

Anti-aircraft artillery is rated for two characteristics: "AA factor", which is essentially a measure of the strength or volume of the AA fire, and "Hit chance", which is the percentage chance that the AA fire will achieve a hit against an attacking plane.

The AA factor is calculated based on the number of AA guns of a particular size on the defending ship that are currently able to fire. Installing more AA guns while building or rebuilding the ship will increase this value. Taking superstructure hits during combat can reduce this value.

The AA hit chance has a base hit value that is modified by:

- Technology improvements
- Local weather conditions that affect visibility
- Night or twilight
- The type of ship firing (destroyers are not as stable gun platforms)
- The quality and quantity of the AA fire direction systems on the ships
- The quality of the ship's crew

- Superstructure damage may reduce the number of AA guns that can fire
- The type of air attack being opposed (dive bombing, level bombing, etc.)
- Quality of radar
- Speed of attacking aircraft
- AA disruption level of the ship

AAA results

AAA fire may damage, destroy, abort or disrupt attacking aircraft. Any of these results will reduce the chance that the attacking squadron will achieve a hit. Damage, destruction and abort results will affect individual aircraft within the attacking section, while disruption effects are applied to the entire attacking section.

Destroyed planes do not execute a bomb attack and are marked as destroyed planes in the squadron. Aborted planes are not damaged but do not execute a bombing attack. Damaged planes may attempt an attack with reduced accuracy. Disruption applies to the entire section and reduces the accuracy of a bombing attack for all planes in the section. A higher level of disruption will affect accuracy more strongly. Disruption will be slowly recovered after the attack as the squadron reforms.

The AA fire sequence

AAA will fire at any attacking aircraft (including friendly attacking planes) prior to the aircraft releasing their ordnance. Heavy AA fires first, followed by medium AA and finally light AA will fire.

Heavy AA from nearby ships may be added to the HAA value of the defending ship. Heavy AA may damage, destroy or abort attacking aircraft and will add to the disruption of the section.

Medium AA fires next, but only MAA from the defending ship may fire. As with HAA, medium

AA may damage, destroy or abort individual attacking planes and also adds to the disruption of the section as a whole.

Following the calculation of MAA fire, the section may have disruption applied, which will reduce the accuracy of their bombing attacks.

Light AA will fire at aircraft attacking their own ship either before or after enemy aircraft release their ordnance, depending on a random roll compared to the speed of the aircraft. The faster the aircraft is, the larger the chance that light AA will fire after the aircraft has dropped its ordnance. LAA will always inflict disruption before aircraft attack, even if their fire takes effect after the aircraft have attacked.

Squadron casualties from AAA fire will be shown in the AIR FORMATIONS screen.

Type 3 Super Heavy AA shells. Once these are developed, they can be used to give some AA capability to heavy (> 6 in) guns of ships. You select their use in the doctrine screen. Using super heavy AA shells will lower your available ammunition by 10%. To represent the doubtful value of these shells in the game, their effectiveness is randomized and highly variable from game to game.

Dropping ordnance

Immediately following the AAA defensive fire, any remaining aircraft in the attacking section will drop their ordnance. When the attacking section is dropping bombs, the hit chance for the bombs will be shown in the log. Any bomb hits will then be displayed in the log. Bomb hits are reported as impacting a type of ship, such as a CL. These reports may be inaccurate.

Types of bombing attacks

There are several types of bombing attacks supported in RTW2.

Dive bombing attacks may be executed only by dive bombers and are the most accurate type of bombing attack. Dive bombers will not be available until the technology for them has been researched.

Glide bombing attacks will be executed by fighters and torpedo bombers that are carrying bombs. Glide bombing is more accurate than level bombing but entails greater risks to the planes. Glide bombing must be researched first to be used.

Level bombing attacks can be carried out by medium bombers, scout floatplanes, patrol bombers with bombs, and torpedo bombers carrying bombs.

Skip bombing is a researched ability. When researched this method will greatly enhance the accuracy of medium bombers. While skip bombing is quite accurate it puts the attacking planes in more danger from AAA than a level bombing attack. It is also restricted to using HE bombs.

Torpedo bombing may be carried out by planes that can carry a torpedo. Typically this is limited to torpedo bombers but some models of medium bombers can also be equipped with torpedoes. Torpedo bombers are the earliest type of planes to be developed that can be used to attack ships. Torpedoes are more effective than bombs when attacking ships. The effectiveness of aerial torpedoes can be improved through research.

Guided bombs must be researched before becoming available. They may be carried by medium bombers. Guided bombs are very accurate and very powerful. Guided bombs will only be available to a limited number of squadrons in a battle, even if invented.

Kamikaze attack - Land based DB and TB will perform Kamikaze attacks if the war situation is bad and the nation has a fascist regime and possesses the Kamikaze trait.

Bomb types

You may specify the size of the bomb load carried by your aircraft when you set up your airstrike but the type of mission being flown will determine the type of bomb that will be used. Until AP bombs are developed through research, aircraft performing a naval strike will load SAP bombs. After AP bombs are developed AP bombs will be carried rather than SAP bombs. AP bombs have greater armor penetration ability than SAP bombs, especially when dropped from a higher altitude, that is level bombers will have better penetration than dive bombers. GP bombs are used when attacking a land target. Near misses by bombs may cause hull damage.

Ships maneuver to avoid bombing attacks

The AI will take control of ships that are under air attack and maneuver them in an attempt to avoid bomb and torpedo hits. This applies to the player's ships, as well as those controlled by the AI.

Aerial torpedo attacks

Aerial torpedo attacks are slightly different than bomb attacks. The attacking torpedo plane section is attacked by AAA in a normal manner. The section drops torpedoes into the water and the torpedoes will move towards the target ship just like torpedoes launched by ships. Friendly air dropped torpedoes will not be visible on the map to the player, as this will give away information on the exact location of the attack.

The targeted ship will be maneuvered by the AI (or by the player himself) in an attempt to avoid the torpedoes. This means slower, less maneuverable targets are more likely to be hit, while smaller more agile targets such as destroyers are more difficult to hit. Targets that are dead in the water are quite easy to hit. If the torpedo misses the targeted ship there is still a chance it may hit a different ship.

Strafing attacks

Escorting fighters that find no enemy fighter opposition at the target location may execute a strafing attack on enemy ships. This attack will inflict AA disruption on the targeted ship, and thus reduce AA accuracy for subsequent attacks, and cause minor superstructure damage. The chance of strafing attacks occurring is influenced by the firepower and experience of the fighters, thus later fighters are more likely to conduct strafing attacks as are more experienced squadrons.

Factors that affect the success of a bombing attack

- Type of bombing attack
- Pilot experience
- The type of naval vessel attacked
- Weather that reduces visibility
- Disruption and damage from AAA
- Twilight or night
- Technological developments
- The type of bomb used (affects penetration and damage, but not accuracy)

Return to base

Following the conclusion of an attack the attacking planes will form up and return to their home ship. Damaged aircraft will have a higher chance of crashing on landing.

Floatplane Scouts

Overview

Floatplanes scouts are handled slightly differently than other planes types in the game. They may be carried by surface warships or deployed at airbases. While used primarily for search, they may also be sent on strikes like other planes. There are a number of special rules governing the equipping and operation of floatplanes that are covered below.

Deploying floatplanes

The player does not use the AIR GROUP MANAGEMENT screen to assign floatplanes to ships. The game will automatically provide floatplanes and restock lost floatplanes for any ships that are designed to carry floatplanes. You will pay maintenance fees for these floatplanes.

Floatplanes may be deployed to land airbases. To do this you simply create a new floatplane squadron on the AIR GROUPS MANAGEMENT screen and assign it to an airbase. The game will then use the floatplanes just like any other planes based at the airbase. When deployed at an airbase floatplane squadrons are identical to other airplane squadrons in every way.

Floatplanes cannot be deployed on carriers.

Floatplanes in Battle

During a battle, floatplanes on ships may be controlled via the SET UP STRIKE screen just like carrier planes. Floatplanes may be sent on any type of strike mission, though they are less effective than most naval planes at any mission other than recon.

You can monitor the activity of your floatplanes on the AIR FORMATIONS screen as with all other aircraft. Floatplanes will go

through the same readying, spotting, take off process as other planes, but the actual activities being simulated are slightly different, which means that floatplanes will often be prepared and launched more quickly than carrier planes.

If "Floatplane search" has been selected in the DOCTRINE SCREEN, floatplanes deployed on ships will automatically be used by used before other planes to conduct searches during battles. If there are not enough floatplanes to cover the search sector, other aircraft will be used. In the PREFERENCES screen under the "Floatplane launch" section there are three settings you can use to control how floatplanes are launched. Checking the "Automatic" option will make the use of floatplanes for search missions completely automatic, free of any intervention by the player. Alternately, you can have the game ask for permission before launching a search. If this is checked, then you will be asked for permission prior to every floatplane being launched on a search mission. If "Manual only" is checked the game will not use floatplanes for search missions unless you specifically assign such missions

Floatplanes will have a somewhat lower reliability for searches than carrier-launched aircraft. There might be cases where a floatplane launch is delayed and your search pattern may be incomplete.

Launching a floatplane

Ships with floatplanes that are not equipped with a catapult will come to a complete halt when launching the floatplane. (Such ships have to crane the floatplane onto the surface of the sea where the floatplane will take off normally.)

Ships that are equipped with a catapult may launch any floatplanes they carry without stopping or slowing down. There is no need for such ships to turn into the wind during a launch.

Landing a Floatplane

All ships that are recovering a floatplane after it has landed must slow down to 10 knots while the floatplane is recovered. This can take several minutes. In a battle situation in which the recovering ship is engaged in gunfire or being fired upon the game will ask for permission before slowing down to recover a floatplane.

Equipping Floatplanes and related equipment

When designing or rebuilding a ship you can equip most ships with one or more floatplanes, a floatplane hangar, and/or catapults. You install these features on the SHIP DESIGN screen, under the "*Flight installations, missiles*" tab.

To set the number of floatplanes you would like the ship to carry, use the spinners or manually type into the "*Air capacity*" field. When you build the ship it will be equipped with that number of floatplanes.

On the same tab, catapults may be installed by selecting the "Add" option under the "Catapults" section and selecting locations into which the catapults will be installed. Note that adding catapults will reduce the amount of topside capacity available for AAA weaponry. More catapults will increase the spot value of the ship, but more than two are seldom required.

On the same tab you can add a Seaplane hangar. The seaplane hangar will reduce the attrition that occurs in each squadron prior to the start of a battle. It is not uncommon

to start a battle with 60% of your floatplanes damaged if they are on a ship that does not have a seaplane hangar.

Note that ships that carry floatplanes have a higher risk of fire, due to the presence of flammable aviation gasoline and other aviation stores aboard.

Each class of ship has limitations on how many floatplanes may be carried.

- DDs and KEs cannot be equipped with floatplanes.
- CLs may carry no more than 4 floatplanes.
- CA and larger warships have no limit on the number of floatplanes that may be carried.
- AMC may carry up to two floatplanes.
- AV may carry any number of floatplanes.
- CVs and CVLs may not carry floatplanes.

Airships

Airships in RTW2 represent rigid frame dirigibles that were primarily used for recon duties. The player will need to build airship bases from which his airships may operate. The player does not design or build individual airships.

Airships work much as other land based aircraft. They are primarily useful for long range scouting, and can fulfill that role when other long range aircraft are not yet developed. They will occasionally perform bombing attacks, but are relatively ineffective in this role.

Airship bases

Airships bases are built in a manner almost identical to airbases. The player selects a possession on the map, which opens a MAP DETAILS screen. Click on the "Build fortification" button and select "Airship

base" from the list of possible fortifications. Next click on the "Area" drop down list to select the exact location within that possession where you want to build the airship base. The time and cost to build the airship base is displayed. Click "OK" to start the building process, which takes 4 months to complete.

You may also click on the "Build fort/base" button on the main menu to begin the process of building an airship base.

An airship base may be built at any base location owned by the player. An airship base may be built in the same location as an airbase. Airship bases may not be expanded. They require a small maintenance fee each month. Airships are more expensive to maintain and more accident prone than other aircraft. They always have poor reliability.

Each airship base will support 8 airships. You do not design or build individual airships; they will be automatically generated by the game at each airship base. Airship capabilities will increase through research into the airship technology.

Airship search

The primary function of airships in RTW2 is to conduct searches. Each turn that the weather permits the airbase will launch some or all of its airships in an attempt to locate enemy ships. They will fly a normal search pattern and issue sighting reports. Airships will return to base prior to sunset.

Airships in combat

Airships may drop bombs on enemy ships though this is quite rare and quite inaccurate. Airships may be attacked by enemy fighters. If you have invented Aircraft carrying airships, all your airships will

automatically deploy two parasite fighters as escort. The fighters will remain in close proximity to the airship and will attempt to engage any enemy fighters that attempt to attack the airship. The parasite fighters will take off and land with the airship.

Airship icons

Airships are shown on the map as small icons that are visible if you zoom in far enough. RTW2 comes with a default airship icon but the airship icon is created in the same way that aircraft icons are drawn and can be modified by the player.

Airship obsolescence

After 1938 AI nations will no longer purchase airship bases.

Questions and Answers (Q&A)

How do I select torpedo type for my ships?

Torpedo quality is dependent on research. Your ships will always have the latest torpedoes that you have developed, and old ships will be automatically upgraded.

Why is there no oil in Borneo/Libya wherever?

The oil fields in the game are those that were in or came into production in the early years of the 20th century. Many well-known oilfields today were not discovered at the time of the game.

Why is not Grenada/Easter Island/Bali a possession in the game?

The possessions in the game are there to represent important pieces of territory for naval purposes or colonies that needed some form of naval presence. However, there is no attempt to include every island or minor colony in the game, that would just clutter up the map to no purpose, so a selection has been made where those that figured prominently one way or another has been included.

How do I break a blockade?

Blockade status depends on the force ratio in a nations build area. You must whittle down enemy strength or add more forces in your home area until the force ratio has changed enough.

Why is my force structure so idiotic? Why can't I select the ships I want for the battles?

The battle generator is made to put the player in various situations that can arise in real life. Real admirals seldom had the luxury of fighting with the ideal forces they would like to have. Some of the best ships might be in dockyard, off refueling or have suffered a mechanical breakdown. Somebody might have issued stupid orders or misleading intelligence might have sent ships off to where they are not available. There are lots of examples of the least modern ships in a navy having to fight battles, and that is what the game seeks to simulate.

Player Notes and Tips

One of the first things you must be aware of is that technical development in this era is fast. As the build times of ships are several years, this means that many ships will be obsolete by the time they are in service. This might be frustrating at first, but it affects your opponents as well. You will have to learn to live with it.

Once you have realized this, the temptation is to put off building new ships until you have researched better technology. The problem with that is that the Navy League or Kaiser will demand ships for national prestige, and a foreign policy crisis might arise much faster than ships are built, leaving you with insufficient forces. You must try to find a balance.

You should try to think of the role and context in your navy when designing a ship. Take cruisers for example. If you have a nation with widespread colonies and interests around the world, you might consider a colonial cruiser. This would be equipped for colonial service, it would probably be best to optimize engines for reliability, and you would want it to have long range. That will cost weight, so it probably won't be very fast, but, we'll get a sturdy workhorse that can show the flag in the colonies and still be useful when war comes to chase down raiders.

On the other hand, there might be a need for dedicated fleet cruiser as a scout for the battle fleet. High speed is desirable, of course, but we can live with cramped accommodation and short range, as it will only be operating in home waters. We can even be bold and optimize engines for performance, accepting the risk of the occasional breakdown. This is the opposite of the workhorse above. Here we have the temperamental racehorse, optimized for one mission, but sensitive and picky.

Yet another cruiser type might be the raider. We would want reliable engines to be able to operate for long time away from friendly bases, and long range is desirable. Speed should be enough to avoid heavy enemy patrolling ships, but we could build her strong enough to defeat what she cannot run from.

These considerations are similar for larger ships. If you are playing Austria-Hungary for example, you have no colonies and no interests outside the Mediterranean. You can go for smallish battleships with low range, cramped accommodation and low freeboard, thus saving weight to make them compact but capable. Keeping down the displacement keeps down costs, so you can build more of them, and you will hopefully be able to fight an opponent with far larger resources but with worldwide obligations that requires him to equip ships for service anywhere in the world.

There are some specialist ships that you should not neglect. The lowly 400 ton corvette is actually an essential unit in any navy. It can patrol the coasts against submarines and its presence in an area will reduce the risks of mine strikes for larger ships. Having a decent number of small corvettes avoids having to use destroyers as ASW patrols, which could denude the battle fleet of destroyers.

Another ship to consider for nations with large colonial interests is the colonial gunboat. This will be a corvette with 1500 tons displacement or so, equipped for colonial service. This makes it good for

fulfilling obligations to have tonnage on foreign stations, freeing up cruisers. If equipped with a couple of 5 or 6 inch guns, it can even be a deterrent to enemy raiding light cruisers.

Changes to battle mode from SAI

* Right clicking the Flotilla attack flag in the main map window will give an opportunity to recall all flotilla attack orders.

* Added more FOW about enemy ships firing. The player now only gets to know that the enemy ship fired # light/medium/heavy guns, and this can be wrong, especially at night.

* Grates fouled now escalate to 'Stokers exhausted' after 300 minutes in coal fired ships, with 2 knot speed loss.

* Torpedo tubes are now displayed on the ship graphics, and share the same "hard points" as the gun armament. This will make design of ships like destroyers more realistic and add to the visual appeal.

* Changed the logic for divisions in core so that if the lead division turns together, the following divisions will follow suit. This makes it easier to withdraw or avoid torpedo attacks with a multi division battle line.

* Change in battle behaviour: If divisions with heavy ships have turn together set, ships ahead of the flagship run a risk of missing commands.

* Destroyer divisions will now keep turn together orders.

* TR will now have a Cargo explodes message instead of Magazine explodes.

* Ships in line abreast or other spread out formations have somewhat larger chance of losing contact than previously.

Appendix 1: Ship type definitions used by the game

These are the definitions used by the game for defining ship types. Anything falling outside these parameters is considered an illegal ship type. The reason these type definitions must be enforced by the program is that the AI relies heavily on ship type for decision making. It also prevents players from building unrealistic ship designs.

These are the main definitions, but there are some exceptions in special cases.

Destroyer (DD)

Displacement less than 2000 and speed Speed more than 19 knots. Must have torpedoes. It cannot be armoured.

Light Cruiser (CL)

Displacement larger than 2000 and less than 8000. Speed must be more than 16 knots and main gun calibre cannot be larger than 6 inches, unless it is a protected cruiser in which case it can have guns in single mountings up to 8 inches.

Predreadnought Battleship (B)

Displacement must be at least 5000 and it must have belt armour at least 6 inches. Main gun calibre must be larger than 6 inches and speed less than 20 knots. It cannot have more than 2 main turrets.

Armoured Cruiser (CA)

Displacement must be more than 4000 and speed greater than 19 knots. It must have more than 2 inches of belt armour but no more than 12 inches. Main guns must be at least 6 inches calibre and cannot be more than 11 inches.

Battlecruiser (BC)

Must have main gun calibre larger than 10 inches and speed more than 23 knots, or three main gun turrets and speed more than 21 knots. In some borderline cases armour thickness can be the difference between a BC and a BB. Speed requirement rises with time, as fast battleships develop.

Dreadnought battleship (BB)

Must have at least 3 main gun turrets, displacement over 8000 and belt armour of more than 6 inches. Main guns must be more than 10 inches.

Corvette (KE)

(this definition actually includes all kinds of minor combatants without torpedoes).

Displacement less than 1800 and belt armour 2 inches or less. Gun calibre can be maximum of 6 inches. Cannot have torpedoes.

Corvettes of 500 tons displacement or smaller are assumed to be civilian trawlers and similar craft impressed for wartime duties. Small corvettes are fast to build but cannot be built in peacetime. They will be automatically sold off after a war, like AMCs.

Armed Merchant Cruiser (AMC)

Displacement more than 1700, no armour and gun calibre no more than 6 inches. AMCs cannot be built in peacetime and will be sold off after a war.

Appendix 2: Explanation of values used in ship design.

Below is a fuller explanation of how to use the ship designer and the meaning of the different data fields. Note that some features can only be used when researched.

Class name: A unique name that distinguishes the class. This is used as filename when saving the class.

Enemy class name: This is the name that the enemy will be told in scenarios. Generated by the program.

Misidentified class name: This is the name the enemy will be told if they have misidentified the ship. Generated by the program.

Displacement: Standard displacement of the ship in tons.

Belt: Belt armor in inches. Note. The program assumes that the belt is thickest in the center of the ship and at the magazines, and thinner at the ends.

BE: Belt extended: Upper strakes of belt armour or armour protecting the ends of the ship.

D : Deck: The main armour deck of the ship.

DE Deck extended: Corresponds to BE above.

T: Main gun turret and barbette armour.

TT: Turret top: Roof of main gun turret.

SEC: Secondary gun armour.

CT: Conning tower armour.

Belt coverage: Can be used to denote narrow belt in classes with narrow belt coverage.

Speed: is the maximum designed speed of the ship.

Torpedo defence: The level of torpedo protection the ship has.

Fire control: The fire control equipment. This is important for the gunnery accuracy of the ship, especially at long range.

Fire control positions: This is the number of fire control positions on the ship. The reason to have more is redundancy. Fire control positions are fragile and can be shot away.

Main gun calibre: Rounded to inches.

Increased elevation: Will give extra range to the main guns.

Gun quality: This is the gun quality of that calibre. It is given by your research and cannot be changed. A value of 5 means that you have not researched that calibre.

Cross deck fire: Check this if the guns of the wing turrets in positions F, G, K, or L should be capable of cross deck fire, like in for example the historical Indefatigable or Kaiser classes.

Main turrets: Main turrets are recorded individually. To add turrets, press 'add' and select position and number of guns in the turret. The positions available is determined by your research.

Secondary guns: are only recorded as to the total number. Note that they have a quality value, just like main guns. Secondary guns are assumed to be placed half on each side of the ship. Note that the graphic representation of the secondary guns is generalized. You can have an odd number of

secondary guns. The graphics logic can't really handle odd numbers of secondaries, but any odd guns left over are assumed to be on the centerline by the gunnery logic.

Tertiary guns: As secondary guns above.

Torpedo tubes: This works much as the main turrets. You select the position and the number of tubes for the mount.

The ship graphic: Here you have a possibility of entering the looks of the ship. This is not necessary, the ship will work fine anyway, but it will look a lot better.

Funnels: Select if you want an oval funnel or round, then click on the button and on the ship. You do not have to worry about clicking on the middle of the ship; the program assumes all funnels are on the centerline, so it only takes account of where you click relative to the length of the ship.

Superstructure: Select if you want a line or a filled polygon. Then click on the button and then add points by left clicking on the ship. Right click when finished. You can only click on the left side of the ship, but the graphic will be mirrored so that it appears on the right side as well when you are finished. There can be a maximum of 10 points for each superstructure item.

When you are satisfied with your ship you should press the check design button to see if there are any issues that needs to be resolved with the ship.

Appendix 3: Instructions for using the ship picture generator

The ship side view generator is optional to use. It is a way of generating nice side views of your ships.

Select the set of ship elements you want to use. Originally there will be only one set, but graphically gifted players may make their own and add for example lighter or darker versions or even camouflaged sets.

First select the background you want and then the type of bow and stern etc and press "Generate". You can change your settings and redo the generation any number of times. When you are satisfied, go to the next tab to place superstructure and details. Note, you should not redo the hull generation once you have started placing details.

To place a ship element on the ship, click on the element and then move the mouse over the ship. Click again where you want to put the element. Ship elements should be placed in the order from left to right, that is start with masts, then decks, then superstructure and last accessories.

To fine tune placement, after moving it to the right area but before clicking on the ship picture, use arrow keys to move the element one pixel at a time, finish by pressing return.

Masts, decks and superstructure will be shown behind hull and turrets. That means that you can regulate the height of masts or superstructure by sinking them into the hull. Accessories will be shown in front of everything else. Use the deck panels under accessories to connect raised decks to barbettes, to make them show in front of the barbettes.

When you are finished, select use and exit and your picture will automatically be assigned to the selected ship class. You can check it by double clicking on the ship in the ship list.

The output is a bitmap that will be stored under the save directory of the current game. It will be named Classname + NationNumber + .bmp. If you want to make some adjustments or improvements to the finished picture, you can do so in any picture editor.

Appendix 4: Changelist RTW to RTW2

For players who are familiar with RTW.

Ship Design – Weaponry

- New aircraft types will be available after 1950 but will have data based on 1950 types plus a linear increase.
- Coastal artillery batteries will have AA guns after 1925.
- 20 inch guns now possible.
- Autoloaded guns will have a 10% higher ROF. When the ship is straddling the target and going to rapid fire they will give a 30% boost to ROF. They also have better AA performance.
- Centreline torpedo mounts cannot be used on AMC.
- It is now impossible to install guns heavier than treaty restrictions in a rebuild
- Retrofit of cross deck firing not allowed.
- Additional ammo now costs more weight than before.
- Risk of magazine hit is now proportional to the number of main turrets.
- To get the benefit of all forward main armament (Nelson or Richelieu configuration) a nation needs to research all forward armament.
- The AI will upgun light cruisers if it finds itself outgunned by player CLs.
- Once invented, diving shells can be selected for use in the ammo doctrine screen. Diving shells have a chance for long range near misses to be converted to hull hits bypassing armour. On the flip side, diving shells have a larger chance of pass through hits and duds.
- When oxygen fuelled torpedoes have been invented, their use can be selected in the doctrine screen. Oxygen fuelled torpedoes give considerably better torpedo performance at the risk of more devastating torpedo explosions if torpedo tubes are hit.
- Fire control radar helps gunnery, and from level 3 will allow blind fire.

Ship Design – AA guns

- AA directors will considerably increase the effectiveness of heavy and medium AA fire. More AA directors will improve AA fire, up to a maximum of 4.
- An AA director will provide a limited anti surface capability if there is no regular director installed.
- Dual purpose guns are about 25% heavier than usual guns, but are capable of both AA fire and engaging surface targets. 4 and 5 inch guns are the most capable DP guns.
- Light and medium AA guns are limited not only by weight, but also by topside space. AA slots are determined by displacement, and are reduced by other equipment, guns, torpedo tubes, radar installations etc.
- The cost of DP guns will decrease over the years. They are more expensive early on.
- The number of AA slots increase somewhat with some techs (multiple AA mountings).
- HAA fire will consume HE ammo.

Ship Design – Protection

- Armour is now increased in effectiveness with technology progress instead of becoming lighter.
- Armour thickness up to 20 in allowed, but an increase in armour over 12 inches will not give the same proportional protection due to difficulties in manufacturing thicker armor plates.
- Inclined belt costs 10% more than a conventional belt. It adds about 10% to the protective effect of the belt, but it also entails a risk that long range hits will be converted to deck or lower belt edge hits.
- Magazine Box - If this option is selected, belt and deck thickness will be halved for hits to areas other than magazines. Belt and deck weight is reduced by 1/3.
- One inch of deck armour can be added in refits.

Ship Design – Graphics

- Improved the placement of secondary turrets in ship graphic.
- Number of superstructure blocks in the ship graphics increased to 6 and number of points in each block increased to 24.
- When editing superstructure, the edited element is highlighted in red.
- When editing superstructure, the edited element will now not be erased until you move the cursor onto the picture. Thus you can select elements until you have found the one you want to edit.
- An XY coordinate display tracks cursor position within the superstructure design picture.
- Ship superstructures that are drawn outside the hull of designs created by the AI will be cropped (though not on carriers).
- Ships can now have asymmetric superstructure and funnels (useful primarily for carriers).

Ship Design – Misc

- A ship design that closely resembles an existing ship will get a reduction to the price and cost of developing the design.
- Anti submarine and mine warfare - Each ship has a rating for its capabilities in these fields. However, if the ship has a capability in more than one of these fields, the effectiveness of each will be reduced, to reflect the fact that the ship has to divide its time between the various duties.
- Bulging now adds 2% to displacement up to a maximum of 500 tons.
- Diesel engines are heavier than steam plants but reduce the weight penalty of long and extreme range. Diesel powered ships have better acceleration.
- Engine rebuilds now take a longer time.
- Improved crew size calculations (crews were too small in RTW1).
- Low freeboard can be selected for all ships, but the benefit is larger for ships with top speed below 21 knots. Ships with low freeboard will have their speed and gunnery affected more in heavy weather than ships with normal freeboard. The ship is simply less weatherly.
- There has been a major overhaul of design calculations to fine tune calculations and handle ship design after 1925.
- Maximum displacement raised to 90,000 tons.

- Maximum speed raised to 40 knots.
- Once you have determined a ship design, that design needs to be developed until construction can start. Developing a design takes from 1 to 4 months, depending on ship type and displacement. Some ship types, AMC and small corvettes, do not have any requirement for development time, as they are converted from existing ships.
- Private shipbuilding expansions will be rarer when using reduced research speed.
- The ship type MS - minesweeper in RTW1 has been replaced with the type KE - Corvette, to better reflect that the type covers various kinds of small surface combatants. Corvettes of 500 tons displacement or smaller are assumed to be civilian trawlers and similar craft impressed for wartime duties. Small corvettes are fast to build but cannot be built in peacetime. They will be automatically sold off after a war, like AMCs.
- Unused displacement in ship designs is limited to 5%.
- When the design has been developed, it is possible to start construction of any number of ships according to that design.
- Radar - Once radar is invented, a nation will receive a number of radar sets per month. Radar sets will be automatically installed in ships with priority given to larger ships and ships in the active fleet. The player can manually install radar sets in ships, with the drawback that the ship will be unavailable the current turn. To manually install radar, right click on the ship in the SHIPS IN SERVICE tab and select "Radar"
- Radar is divided into search radar and fire control radar. Search radar makes it possible to detect other ships in poor visibility. Radar detected enemy ships and planes will show as greenish outlines on the map. Early search radars are unreliable and prone to malfunctions. They are easily disabled by hits or even by own ship's guns firing.

Changes to Battles

- Risk of magazine hit is now proportional to the number of main turrets.
- Reduced the tendency of ships with heavy flooding to go faster than safe speed.
- Fire control radar helps gunnery and from level 3 will allow blind fire.
- Autoloaded guns will have a 10% higher ROF. When the ship is straddling the target and going to rapid fire they will give a 30% boost to ROF. They also have better AA performance.
- Added invasion missions.
- Speed of invasion transports changed to 12 knots.
- Invasion transports will stop at the objective after reaching it, to simulate vulnerable transports unloading.
- Merchant ship speed raised to 8 knots.
- Merchant ship size will increase over the years.
- Increased point value of both sunk and surviving merchants in convoy battles.
- Ship name display setting in tactical screen now saved.
- Changed the median speed button on main map screen to 20 knots.
- Changed Median speed button in division screen to cruise speed.
- Added new battle sounds.

- Improved AA formations for naval forces (need to be researched to take effect).
- Added "Set speed and course for all divisions in force" button to division screen of force flag division for Rear Admiral mode.
- AI controlled divisions may no longer have their course set.
- Most button settings in the battle screen are now saved.
- The weather in Northern Pacific area is more foggy and generally worse.
- DD and MS assigned to trade protection will be on ASW patrols or assigned as convoy escorts.
- Cruisers assigned to trade protection will patrol against enemy raiders and provide heavy convoy escort.
- Allied ships may show up on your side in battles. Similarly, if you are at war with two nations, the allies of your enemy may show up.
- Allied bases and coastal batteries will be present in battles.
- There is now a chance for fast battleships (> 26 knots) to appear in cruiser battles.
- Destroyer raids and coastal raids will be more likely to take place at night as airpower becomes more common.
- Battles will not end if one side still has to reach the objective.
- New aircraft types will be available after 1950 but will have data based on 1950 types plus a linear increase.
- Coastal artillery batteries will have AA guns after 1925.
- Torpedoes in the water, or Aircraft with the mission "Naval strike" in the air, will prevent a battle from ending just like enemy ships in sight.
- Aircraft losses are included in VP points calculations at the end of a scenario.

Events

- There have been a number of new events added.
- Blitzkrieg – When this event fires it means that an AI country has invaded and taken control of a neutral territory or nation. You may be offered a chance to respond in some manner.
- You may be offered the chance to execute a blitzkrieg against another territory. It is your option to accept. There may be political consequences.
- Air/Sea rescue option will be offered sometime in the 1940s. I think this is presented like an event?. Accepting the option increases the survival chances of pilots. It helps mitigate adverse effects on pilot experience from aircraft losses. It increases aircraft maintenance costs.

Fleet Exercises

- You can hold a fleet exercise once a year with any ships you select from your own fleet. Ships participating in the exercise will cost twice the active maintenance cost and gain some experience. Large fleet exercises can raise tensions.
- You will be able to select any of your own nation's ships to participate in the exercise, create divisions and subordination, set the time of day and weather, and then fight the simulated battle.

Invasions

- You can select a possession as target for invasion planning. If the conditions for a successful invasion are met (a substantial force with 4:1 superiority in the area) there is a chance that the invasion will take place. Invasion preparations will cost 1% + 300 000 every turn. Note: There will be no spontaneous invasions like in RTW1. You have to select a target to make an invasion happen.
- There will be no offer of a surprise invasion if there are no available invasion targets.
- Surprise invasions cannot be launched against home areas.
- When an invasion occurs there will generally be an invasion battle in which you will need to deliver several transports to an enemy shore.
- The speed of invasion transports will be 12 knots and they will be controlled by the AI.
- Invasion transports will stop at the objective after reaching it, to simulate vulnerable transports unloading. The required number of transports must survive for a certain amount of time to successfully unload.
- After troops have landed, additional invasion battles may take place. Winning these battles will make it more likely that your invasion will succeed.
- After a landing has taken place you will not longer need to pay the invasion preparation costs.

Strategic turn and Map

- Trade warfare, both in the form of raiders and submarines, is now summarized in one screen instead of a number of separate messages.
- The Trade protection role (TP) replaces the RTW1 role of ASW patrol.
- Ships assigned to trade protection will not normally be available for fleet operations. However, in non home areas, any ship present might be used in battle.
- DD and MS assigned to trade protection will be on ASW patrols or assigned as convoy escorts.
- The ship type MS - minesweeper in RTW1 has been replaced with the type KE - Corvette, to better reflect that the type covers various kinds of small surface combatants. Corvettes of 500 tons displacement or smaller are assumed to be civilian trawlers and similar craft impressed for wartime duties. Small corvettes are fast to build but cannot be built in peacetime. They will be automatically sold off after a war, like AMCs.
- Ships equipped with minesweeping gear will contribute to a minesweeping value for each area. This value will be compared to enemy minelaying capabilities in the area to determine the risk of ships striking mines during operational movement and also influence the number of minefields during battles.
- Anti submarine and mine warfare - Each ship has a rating for its capabilities in these fields. However, if the ship has a capability in more than one of these fields, the effectiveness of each will be reduced, to reflect the fact that the ship has to divide its time between the various duties.
- Ship types capable of ASW warfare are DD, MS, CV and CVL. Ships capable of ASW warfare have an ASW rating. The ASW rating of a ship depends on displacement and installed equipment. All DD and small ships will automatically have a basic amount of depth charges when these are

invented. Additional ASW equipment, like increased storage of depth charges, K guns and ASW mortars, need to be added to the design and will cost weight.

- The ASW value of CV and CVL will initially be low, but will increase with development of aerial depth charges and airborne radar.
- AMC will have a limited ASW value during the early period (as Q-ships).
- An ASW value summary is shown in main screen.
- The world map has had some zones added to it, to emphasize the importance of the Suez canal and to make the map better suited to wars in the Pacific.
- Nations without access to oil run a risk of suffering fuel shortages in wartime. The risk of fuel shortage occurring in a turn will increase the longer the duration of the war. If a nation is blockaded, the risk of fuel shortage will increase considerably.
- In a turn with fuel shortage, there is a risk that ships will have ordered strategic moves cancelled or that they will be unable to take part in a battle. The larger the ship, the greater the risk of being affected.
- Ships using coal fuel will never be affected by fuel shortages.
- Private shipbuilding expansions will be rarer when using reduced research speed.
- Ships changed from FS status will have any move orders cancelled. BG-336
- Only one message is shown if multiple DD are commissioned (like KE)
- There is a diminishing colonial value for ships above 6000 tons (to encourage using smaller cruisers for colonial service).
- Added preferences for end of turn messages.
- Added new possessions: Norway, Greece, Hokkaido, Hainan, Iceland.
- New default map colors
- Trade warfare, both in the form of raiders and submarines, is now summarized in one screen instead of a number of separate messages.
- Added new default map colors.

Start options and Game settings

- Increased to nine save slots.
- Slow aircraft development
- AI advantage (adds 10% to the economy of all AI nations)
- 1920 - Treaty of Versailles in effect
- 1920 - Arms limitation treaty in effect
- 1920 - Historical Washington treaty
- 1920 - Random treaty
- New sound effects
- Floatplane launch settings
- Air combat messages
- Air to surface and AA messages
- Pause game on Air attack

- New sighting
- New report
- Air attack warning
- Air control of friendly forces
- Sound and video - Background sound settings
- Sound and video - Sound volume
- Doctrine - Various - Use oxygen fuelled torpedoes
- Doctrine - Various - Use diving shells (AP only)
- Doctrine - Various - Use heavy AA shells

- Doctrine - Various - Use pilot training - Player can select elite pilot training (Japanese style). This gives an elite corps of well trained pilots. However, the system is more effective in peacetime and hard to keep up in wartime. Losses will have a more severe effect on aircrew experience levels. Fuel shortage affects pilot training.
- Doctrine - Various - Use floatplane search priority

Changes to research
- To get the benefit of all forward main armament (Nelson or Richelieu configuration) a nation needs to research all forward armament.
- Research up to 12 % allowed (but there is a diminishing return factor).
- Added option for slow aircraft development.
- Added Air/Sea rescue option.
- New research areas will be "discovered" and not be visible in the list until discovered.
    - Shipboard aircraft operation
    - Radar and electronics
    - Naval aviation, lighter than air
    - Naval aviation, heavier than air
    - Missile technology
    - Anti aircraft artillery
    - Amphibious operations

Changes to Politics
- It is now impossible to install guns heavier than treaty restrictions in a rebuild.
- There will be no demand for a BB if nation is limited by peace treaty.
- Added option for arms control treaties in effect at start of 1920 game.
- Added option for Treaty of Versailles in effect at start of 1920 game.
- Alliances have a larger chance of being revoked if one nation is fascist/communist and the other is liberal democracy.
- Alliances will not be revoked during war. Instead, your ally may seek a separate peace if tension with them goes high enough.
- Decolonization will be slower for fascist regimes.

- If a possession is taken in a peace treaty, all batteries under construction and all bases under construction will be destroyed.
- A carrier taken in a treaty will not include any air units.
- If government type is Fascist or Communist, there is a chance the leader will repudiate the treaty.
- Limited the naval budget for nations under peace treaty restrictions.
- The effects of revolution will be diminished when clearly winning.